

THE AUTOMOBILE

BIG TOWN IS HAVING ITS BIG CARNIVAL



BENZ
Free-for-all winner

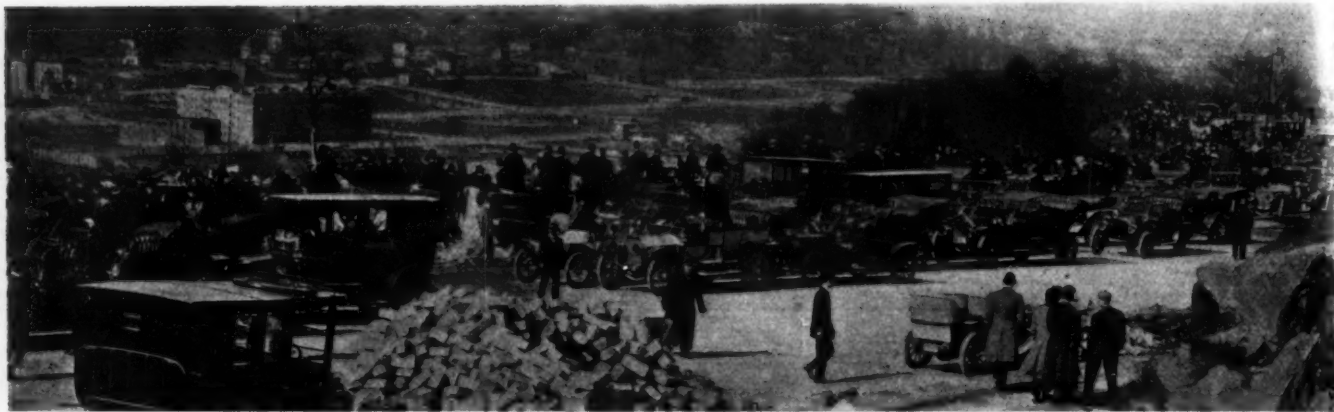
"TO commemorate the eleventh anniversary of practical automobile construction in this country," is the reason given by the New York Automobile Trade Association for its second carnival week in the "Big Town" of the country. The affair has assumed stupendous proportions, and unquestionably the attention of the general metropolitan public has been focused on the motor-driven vehicle and its present foundation of permanent stability. With a hill climb Monday wherein the cars easily surmounted the steep grade, record-breaking straightaway performances in Queensboro on Tuesday, and Wednesday devoted to visiting the bunting and flag-decorated stores of "Automobile Row," the carnival is now in successful swing, with more spectacular events to come. To-day will include the transport of the military and a grand opera performance at the Majestic theatre, Friday will be punctuated with a one-gallon efficiency test, and Saturday is to have a big afternoon parade and a concluding

evening of jollification in the form of a smoker at the A. C. A.

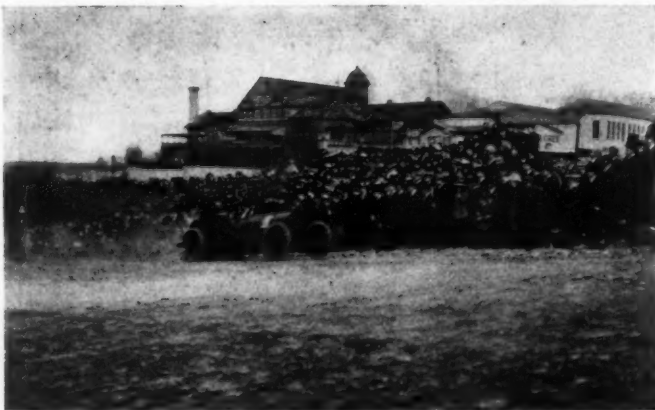
There has been work in plenty in the preparation and conduct of the carnival, the executive and finance committee of which consists of these leading workers: Gen. John T. Cutting, chairman; Percy Owen, president New York Automobile Trade Association; Frank Eveland, C. R. Teaboldt, Col. K. C. Pardee, C. W. Wurster, C. P. Skinner, Alexander Howell, R. G. Howell, A. J. Inderrieden, and Walter R. Lee, secretary.

When one brings to mind the now historic "run," promoted on Decoration Day, 1896, by John Brisbane Walker, in which two Duryea cars out of six contenders survived the trying journey of 26 miles from the City Hall to Irvington-on-the-Hudson and return, and compares it with the events of this week, he then comprehends the enormous strides accomplished in the making of the greatest industry of modern times. Then the automobile was more or less a subject of jest; now it is a pleasurable necessity.

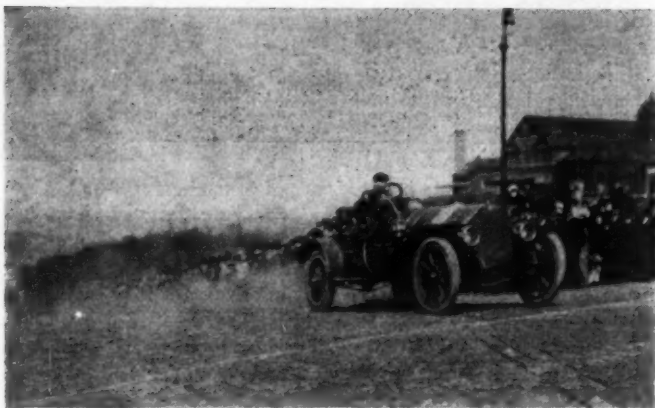




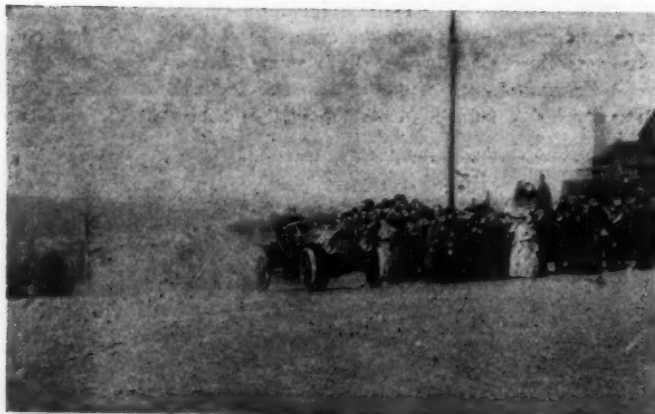
At the Top of Fort George Hill the Scene Resembled an Outdoor Automobile Show.



National, Aitken Driving, Fastest of the Six-Cylinders.



P. & S. Winner, with Lescault at the Wheel.



Chalmers-Detroit, Star Performer, Knipper Driving.

STOCK CARS REAL FEATURE OF CLIMB.

Though the unthinking public was naturally attracted and enthused by the record-breaking Benz in the contests up Fort George Hill, those given to deduction in affairs of this kind saw more practical performances in the regular stock car events. Out of the field of 41 there were less than a handful of special built racers, and the times made by the stock models were very fast indeed. The 120-horsepower Benz and David Bruce Brown, the combination so successful in Florida recently, flashed up the 11 per cent. grade in 28 4-5 seconds, 3 2-5 seconds better than the best in the 1908 climb and 1-5 better than the record of 1907.

As in previous Fort George climbs the 1,900-foot Belgian-blocked hill, start was standing, with a short dash across the street, through a narrow passage-way, not more than eight feet wide, and then the contestants would be on the hill proper, with a steady rise to the top. Thousands scattered along the walks or the steeper higher ground, some even being in the trees, while at the summit there was a large representation in cars. Perfect weather, a clear course with ample police protection, and good management combined to begin the first actual celebration of the week in ship-shape order. Starter Wagner sent the 41 contestants off in exactly an hour. All sizes of autos were on the list, from the little Maxwell Juniors of 10 horsepower to the big "sixes" of 90 and the bigger fours of 120.

Price classification was used in dividing the stock cars, the free-for-all, of course, being open to all sizes and styles of motive power. Gasoline had full sway towards making records, for this was the only type of car entered, with the exception of the two electrics. The interest for many of the spectators centered in the big fellows entered in the free-for-all and the larger class events, for it was in these that the fastest ascents were made.

The speed averaged from 30 to 45 miles per hour, from the less than half a minute time of the Benz, whose speed was exactly 45 miles per hour average and greater than that on the hill proper, to the six scores of over a minute. Brown in the German racer was followed in :31 1-5 by Webb in a Panhard of 120 horsepower which took part in the 1908 Grand Prix. These two big ones were of special character, and the figures of the stock National "Six," 33 3-5, only 2 seconds less than the Panhard, was a tribute to stock construction, inasmuch as it was the fastest time of the day made by a regular model.

The medium-priced cars of present popularity showed up in fine style, in numbers and in time, there being eight starters in the class between \$2,001 and \$3,000. A Chalmers-Detroit "Forty" led in :40 4-5, with Bourque in the Knox 2-5 of a second away, and the frequently-competing National third. Buick and Oakland divided the class between the \$1,301 and \$2,000 marks, Burman winning in :40 2-5. The two Oakland cars with their off-set crankshafts both made the entire run, after the start, upon high speed, Bauer and Dennison taking the climb excellently.

Mrs. Joan Newton Cuneo desired to try the hill in the Knox, but the officials declined to allow her, inasmuch as the event was held under an A. A. A. sanction, and the national body has de-

cided that only male drivers shall compete. Owing to the fact that Mrs. Cuneo's name was on the program for a special exhibition event many people expected to see her.

The officials of the day were as follows: Chairman, Col. K. C. Fardee; referee, Robert Lee Morrell; starter, Fred J. Wagner; judges, Alfred Reeves, S. A. Miles; technical committee, A. L. McMurtry, H. H. Law, A. H. Whiting; clerk of course, Alexander Howell; steward, J. E. Goewey; announcer, C. T. Earl. The summary follows:

GASOLINE CARS SELLING FOR \$850 OR LESS.

Car.	H.P.	Cyl.	Bore	Stroke	Gear	Driver.	Time.
Maxwell	10	2	4 in.	4 in.	4	Mannebach	2:28
Maxwell	10	2	4	4	4	Ross	2:32

GASOLINE CARS SELLING FOR \$851 TO AND INCLUDING \$1,300.

E-M-F	30	4	4	4 1-2	3	Taylor	53 2-5
Bulck	18	4	3 3-4	3 3-4	4 1-2	Finch	56 1-5
Bulck	18	4	3 3-4	3 3-4	3 1-2	Jones	1:00 1-5
Mitchell	24	4	4	4	3 3-8	Delamater	1:02 4-5
Overland	30	4	4	4 1-2	4	Baumhofer	1:03 4-5
Maxwell	18	4	3 3-4	4	3 1-2	Dahl	1:07 2-5

GASOLINE CARS FROM \$1,301 TO AND INCLUDING \$2,000.

Bulck	30	4	4 1-2	5	3 1-2	Burman	40 2-5
Oakland	40	4	4 1-2	5	3 1-2	Bauer	46 1-5
Oakland	40	4	4 1-2	5	4	Dennison	46 3-5
Bulck	30	4	4 1-2	5	3 1-2	Warren	52 1-5

GASOLINE CARS FROM \$2,001 TO AND INCLUDING \$3,000.

Chalmers-Detroit	40	4	5	4 3-4	3	Knipper	40 4-5
Knox	38	4	4 7-8	4 3-4	3 1-2	Bourque	41 1-5
National	35	4	4 3-4	4 3-4	2.7	Aitken	42 3-5
Palmer & Singer	60	6	4 3-4	5 1-2	3	Palmer	43
Moon	30	4	4 1-2	4 1-2	3	Davis	45 4-5
Columbia	29	4	4 1-4	4 1-2	3 1-2	Coffey	46 3-5
Palmer & Singer	60	6	4 3-4	5 1-2	3	Howard	49 3-5
Pope-Hartford	30	4	4 7-8	5 1-4	3 1-2	Chandler	56

GASOLINE CARS FROM \$3,001 TO AND INCLUDING \$4,000.

Palmer & Singer	60	6	4 7-8	5 1-2	3	Lescault	41 2-5
National	35	4	4 3-4	4 3-4	2.7	Aitken	42 1-5

FOUR-CYLINDER GASOLINE CARS SELLING FOR \$4,001 OR OVER.

Simplex	90	4	6 1	5 3-4	2	Robertson	34 4-5
Stearns	30-60	4	5 3-8	5 7-8	4	Dolg	37 4-5
Simplex	50	4	5 3-4	5 3-4	2	Broesel	38 2-5
Stearns	30-60	4	5 3-8	5 7-8	3	Rutherford	45 1-5
Stearns	30-60	4	5 3-8	5 7-8	3	Swan	46 4-5

SIX-CYLINDER GASOLINE CARS FOR \$4,000 OR OVER.

National	60	6	5	5	1.87	Aitken	34 2-5
Stearns	45-90	6	5 3-8	5 7-8	2 1-2	Burke	40 1-5
Acme	50	6	5	5	2 1-2	Patschke	42 2-5

FREE FOR ALL.

Benz	120	4	6 1	8	1.3	Brown	28 4-5
Panhard	120	4	6 1	7 1-2	2	Webb	31 3-5
National	60	6	5	5	1.87	Aitken	33 3-5
Knox	48	4	5 1-2	5 1-2	3	Dennison	33 4-5
Stearns	45-90	6	5 3-8	5 7-8	2 1-2	Burke	36 3-5
Columbia	29	4	4 1-4	4 1-2	3	Coffey	37
Royal Tourist	48	4	5 1-2	6	3	Jardine	42 1-5
Stearns	30-60	4	5 3-8	5 7-8	4	Fickling	44 3-5
Renault	60	4	6	6	2	Basle	45 1-5
Babcock	3				9 3-4	Peck	54 4-5

ELECTRIC CARS.

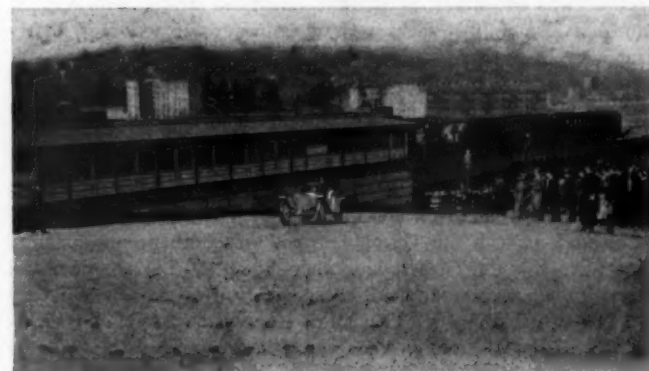
Babcock	3				9 3-4	Wagner	1:24 4-5
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Colonel K. C. Pardee, the Hill Climb Chairman.



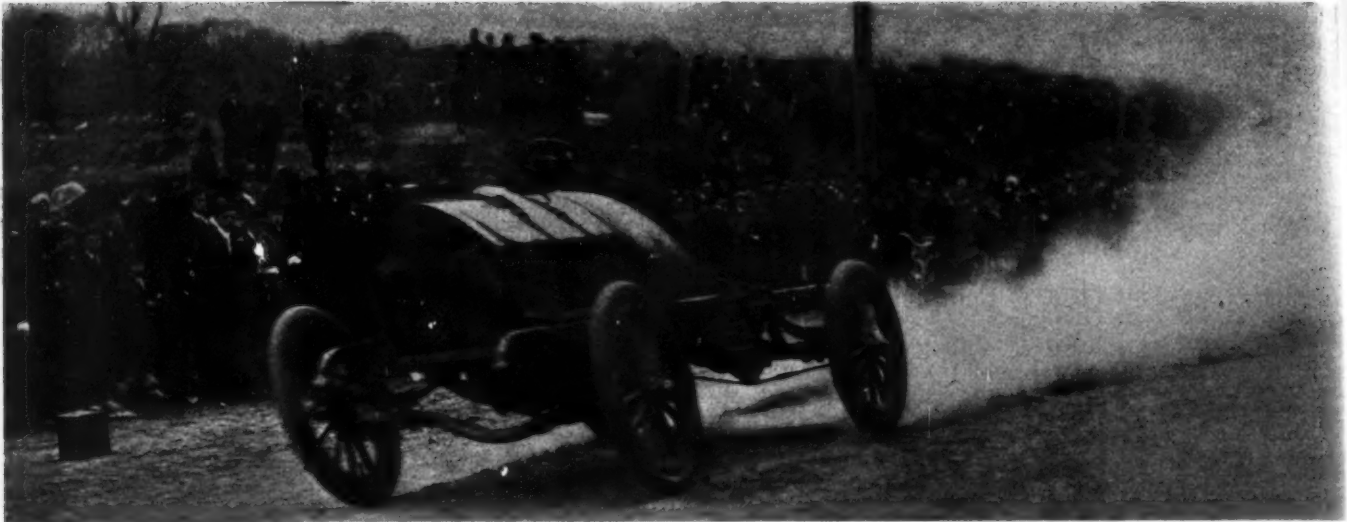
Maxwell, Which Took the Pony Honors.



Babcock Electric, Which Traveled Under the Minute.



George Robertson, Vanderbilt Cup Winner, Winner of the Four-Cylinder Over \$4,000 Class, with 90-Horsepower Simplex.



Knox, Driven by Bourque, Which Captured One Event and Tied First Place in Another.

GREAT SPEED IN JAMAICA STRAIGHTAWAYS.

Rough and dusty was the course on Hillside avenue, Jamaica, Long Island, Tuesday, when the entire attention of the "Big Town's" automobilists was moved across the East river and into Queens borough. One and two mile distances had been laid out, electric timing arrangements made, and some 10,000 people gathered along the route to see an afternoon of real sport. Again David Bruce Brown made the feature runs of the day, with the big Benz, its time of 35 3-5 seconds, a rate of 101.69 miles per hour, lowered the world's record for the distance over a road. It was apparent to the spectators that the speed of the great machine was enormous, as it came down the stretch with a thick cloud of dust rolling back from it. The crowd was not highly disappointed when on its first trip on the longer course the timers were not as quick as the car, and no time was caught, necessitating another run. The second trial was probably equally as fast as the first, the time being 1:16 2-5, a rate of 94.24 miles per hour, for the two miles, 2 4-5 seconds better than the score of the Hotchkiss last year. Likewise, Brown's record of 35 2-5 broke that of last season for the mile by 3 1-5 seconds.

But fast as was the German, there were other cars blowing chips from the block of "Old Father Time" during the day, and some of them were real stock cars, with full equipment and only in a few cases stripped. The Knox team made a splendid showing, Dennison in the 48-horsepower car covering the mile in

1:41 3-5 in the last event of the day, run as dusk started in, at a rate of 86.53 miles per hour; and in the one-mile free-for-all his time was nearly as good, 1:42 2-5, a rate of 84.9 m.p.h.

The National "Six" took next honors among the stock cars, Merz taking it over the short distance in 44 seconds, an 81.8 miles an hour rate. George Robertson was at the wheel of the big Panhard, inasmuch as his Simplex had been ruled out as not being a stock car, and with the big French car he took second place in both free-for-alls.

It was a peculiar incident, and one which shows the evenness with which the modern stock car develops its power, that the classes were all won by the same cars in the two sets of events.

There were no untoward incidents or approaches to accidents, except in the one mile free-for-all, when Coffey, driving the light Columbia, swung too sharply in rounding the slight curve into the homestretch and appeared to run off the road into the grass. He straightened out, however, and his time was not materially affected, being 54 4-5 seconds. The roughness of the course caused a great deal of bouncing and the few larger holes sent the cars up into the air somewhat. The only event scheduled which was not run was that of running as slow as possible on high speed. It was decided that this would take too long, inasmuch as the Oakland, driven by Dennison, had averaged two miles an hour for the distance in the morning, taking about 30 minutes to go one mile. There were only two entries.

ONE MILE FREE-FOR-ALL.

Pos.	Car.	H.P.	Cyl.	Bore.	Stroke.	Driver.	Time.
1.	Benz	120	4	6.1	8	Brown	:35 2-5
2.	Panhard	120	4	6.1	7 1-2	Robertson	:39
3.	Knox	48	4	5 1-2	5 1-2	Dennison	:42 2-5
4.	National	60	6	5	5	Merz	:44
5.	Renault	60	4	6	6	Basle	:47 1-5
6.	S. P. O.	18	4	3.34	4.33	Adams	:49 4-5
7.	Columbia	29	4	4	4 1-4	Coffey	:54 4-5
8.	Lozler	50	4	5 1-2	5 1-2	Cobe	:55 1-5
9.	Knox	38	4	4	4 7-8	Bourque	:56
10.	Babcock	3				Peck	No time

TWO MILES FREE-FOR-ALL.

1.	Benz	120	4	6.1	8	Brown	1:16 2-5
2.	Panhard	120	4	6.1	7 1-2	Robertson	1:24 4-5
3.	Knox	48	4	5 1-2	5 1-2	Dennison	1:32
4.	Knox	38	4	4 7-8	4 3-4	Bourque	1:35 1-5
5.	National	60	6	5	5	Merz	1:35 2-5
6.	Renault	60	4	6	6	Basle	1:40
7.	Columbia	29	4	4	4 1-4	Coffey	1:45 4-5
8.	Babcock	3				Peck	2:47

ONE MILE—SIX-CYLINDER GASOLINE CARS, OVER \$4,000.

1.	National	60	6	5	5	Merz	:48 3-5
2.	Stearns	45-90	6	5 3-8	5 7-8	Burke	:58 1-5

TWO MILES—SIX-CYLINDER GASOLINE CARS, OVER \$4,000.

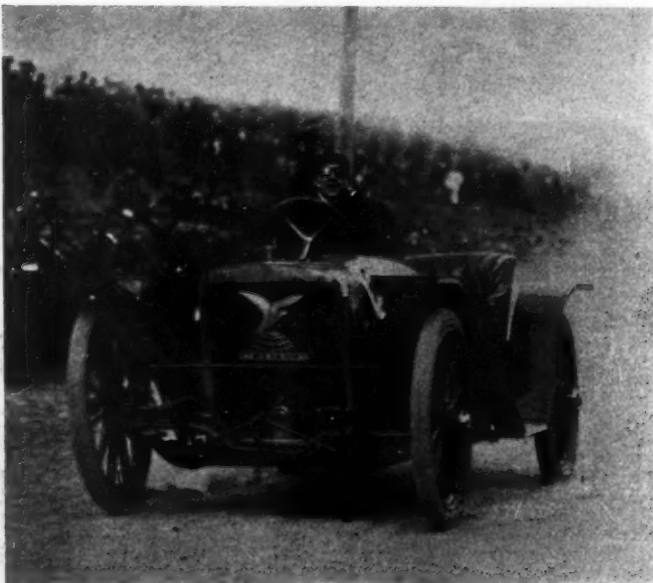
1.	National	60	6	5	5	Merz	1:42
2.	Stearns	45-90	6	5 3-8	5 7-8	Burke	1:57 1-5

ONE MILE—FOUR-CYLINDER GASOLINE CARS, OVER \$4,000.

1.	Stearns	30-60	4	5 3-8	5 7-8	Rutherford	:53 1-5
2.	Stearns	30-60	4	5 3-8	5 7-8	Allen	:55 4-5

TWO MILES—FOUR-CYLINDER GASOLINE CARS, OVER \$4,000.

1.	Stearns	30-60	4	5 3-8	5 7-8	Rutherford	1:51 3-5
2.	Stearns	30-60	4	5 3-8	5 7-8	Allen	1:55 1-5
3.	Stearns	30-60	4	5 3-8	5 7-8	Swan	1:58 2-5



American, Driven by Redstar, Was a Fast Performer.

ONE MILE—GASOLINE CARS, FROM \$3,001 TO AND INCLUDING \$4,000.

Pos.	Car.	H.P.	Cyl.	Bore.	Stroke.	Driver.	Time.
1.	American	50-60	4	5 3-8	5 1-2	Redstar	1:00
2.	Haynes	50	4	4 1-4	5	Shuttleworth	1:03 1-5

TWO MILES—GASOLINE CARS, FROM \$3,001 TO AND INCLUDING \$4,000.

1.	American	50-60	4	5 3-8	5 1-2	Redstar	2:00 1-5
2.	Haynes	50	4	4 1-4	5	Shuttleworth	2:13 2-5

ONE MILE—STOCK CHASSIS, CARS OVER \$3,000.

1.	Knox	48	4	5 1-2	5 1-2	Dennison	:41 2-5
2.	Blanchi	70	4	5.9	6.68	Hutt	:49 4-5

TWO MILES—STOCK CHASSIS, CARS OVER \$3,000.

1.	Knox	48	4	5 1-2	5 1-2	Dennison	1:34 2-5
2.	Lozier	50	4			Cobe	1:49 4-5
3.	Blanchi	70	4	5.9	6.68	Hutt	1:50

ONE MILE—GASOLINE CARS, FROM \$2,001 TO AND INCLUDING \$3,000.

1.	Knox	38	4	4	4 7-8	Bourque	:56 2-5
2.	Chalmers-Det.	40	4	4	5	Knipper	:56 2-5
3.	P. & S.	60	6	4 3-4	5 1-2	Palmer	:56 4-5
4.	P. & S.	60	6	4 3-4	5 1-2	Wallace	:57 4-5
5.	P. & S.	60	6	4 3-4	5 1-2	Howard	1:01 4-5
6.	Columbia	29	4	4	4 1-4	Coffey	1:03 3-5
7.	National	35	4	4 3-4	4 3-4	Altken	1:06 4-5
8.	Pope-Hartford	40	4	4 7-8	5 1-4	Hines	1:18 1-5

TWO MILES—GASOLINE CARS, FROM \$2,001 TO AND INCLUDING \$3,000.

1.	Knox	38	4	4 7-8	4 3-4	Bourque	1:56
2.	P. & S.	60	6	4 3-4	5 1-2	Palmer	1:56 4-5
2.	Chalmers-Det.	40	4	5	4 3-4	Knipper	1:56 1-5
4.	P. & S.	60	6	4 3-4	5 1-2	Wallace	2:00
5.	National	35	4	4 3-4	4 3-4	Altken	2:02 4-5
6.	Columbia	29	4	4 1-4	4 1-2	Coffey	2:09
7.	Pope-Hartford	40	4	4 7-8	5 1-4	Hines	2:16 1-5
8.	P. & S.	60	6	4 3-4	5 1-2	Howard	2:20 4-5
9.	Pope-Hartford	40	4	4 7-8	5 1-4	Chandler	2:25 1-5

ONE MILE—GASOLINE CARS, FROM \$1,251 TO AND INCLUDING \$2,000.

1.	Buick	30	4	4	4 1-2	Burman	:55
2.	Buick	30	4	4	4 1-2	Warren	1:03 2-5
3.	Cadillac	30	4	4	4 1-2	Le Duc	1:09 4-5

TWO MILES—GASOLINE CARS, FROM \$1,251 TO AND INCLUDING \$2,000.

1.	Buick	30	4	4 1-2	5	Burman	1:52
2.	Buick	30	4	4 1-2	5	Warren	2:13 2-5
3.	Cadillac	30	4	4	4 1-2	Le Duc	2:28

ONE MILE—GASOLINE CARS SELLING UNDER \$1,250.

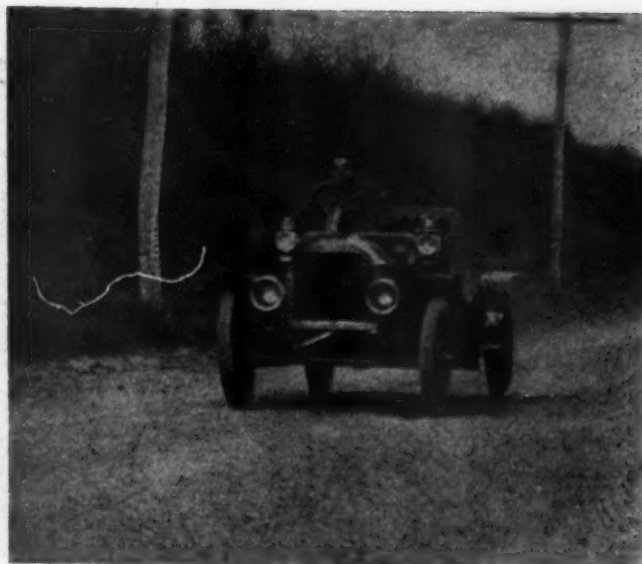
1.	E-M-F	30	4	4	4	Stark	1:09 4-5
2.	Buick	18	4	3 3-4	3 3-4	Jones	1:10 2-5

TWO MILES—GASOLINE CARS SELLING UNDER \$1,250.

1.	E-M-F	30	4	4	4 1-2	Stark	2:22 3-5
2.	Buick	18	4	3 3-4	3 3-4	Jones	2:26 1-5
3.	Buick	18	4	3 3-4	3 3-4	Finch	2:28 4-5
4.	Maxwell	18	4	3 3-4	4	Sickinger	2:51 1-5

WEDNESDAY SOUVENIR DAY—A DINNER-DANCE.

Wednesday's part in the festivities was that of "Souvenir Day," when the dealers in the local trade were given a particular chance to be hosts. "Automobile Row" fairly hummed, and some very pretty and valuable souvenirs were given to recognized customers and friends. A dinner-dance was held in the evening at the Hotel Marseille, 103d street and Broadway, dinner starting at 8:30 with the dance beginning at 11 o'clock.



Stark in E-M-F, Winner of Two Small Car Classes.

THURSDAY, FRIDAY AND SATURDAY.

A military demonstration, including transporting of the Ninth Regiment to Larchmont and a sham battle, is going on this afternoon. About 150 cars were marshaled this morning and taken to the Armory, where the troops were in readiness with full equipment. They were taken to the Heathcote Arms, on the Boston Post road for the active work on their part.

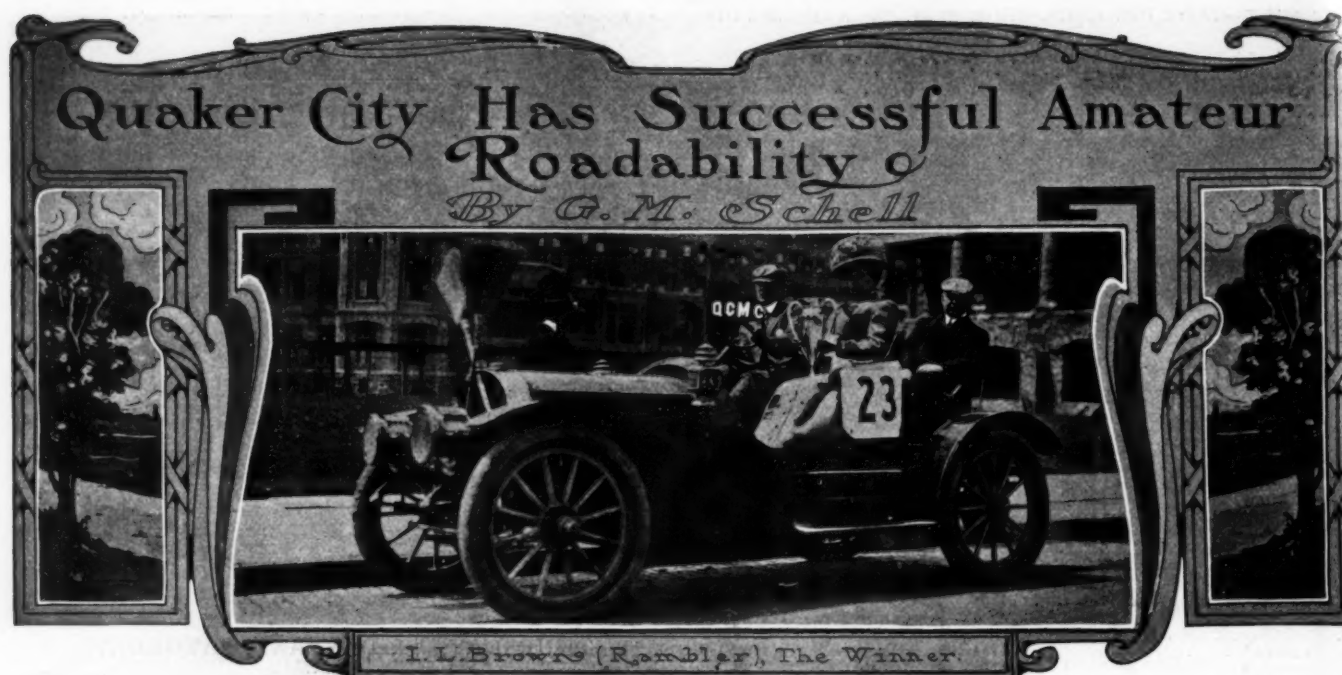
The Imperial Grand Opera Company this evening at the Majestic Theater will have a special performance as a part of the celebration, with "King Guy" and "Queen Annette" attending.

The one-gallon efficiency contest will be held to-morrow (Friday) and should be most interesting. Each car will be given a single gallon of gasoline and sent away on a route not to be announced until the start. The cars will be classed according to price and a basis for accurate comparison will be secured in multiplying the weight (including the passengers) by the distance covered. There will be an observer on each contesting car, and in his charge will be a two-gallon can of gasoline with which to make the return trip. Thos. J. Fay, ex-president of the Society of Automobile Engineers, will act in the capacity of chief inspector of the cars. A. C. Bergman, a member of the society, will assist Mr. Fay.

From the spirited voting for the king and queen of the carnival, interest has been aroused in the pageant which will pass through the upper part of the city on Saturday, starting from Broadway and Eighty-fourth street. Saturday evening the A. C. A. will give a smoker to the Trade Association.



Stearns "White Lines," Driven by Private Owners, Were Out in Force in Their Classes.



PHILADELPHIA, April 26.—The second annual roadability run of the Quaker City Motor Club last Saturday afternoon, to Atlantic City, demonstrated that it is quite possible to pull off a real automobile contest without the aid of the professional element and at the same time inject sufficient of the spirit of rivalry to keep the competitors on the *qui vive*—and incidentally refrain from fracturing the speed laws. Sixty-nine cars started from the Hotel Walton, J. C. Bartlett's Woods electric coupé taking the word at 1 o'clock sharp, the others following at one minute intervals. The route, via Egg Harbor and May's Landing, was 68.2 miles long, and the official secret time, set by Mayor Reyburn, of this city, was 3 hours 46 minutes 30 seconds.

George Proud's Rambler, driven by Ira Brown, was declared the winner of the "grand" prize, coming under the wire just 22 seconds before the official limit expired. The "place" prize went to "Dick" Sellers, who drove his Pennsylvania over the course within 1 minute 43 seconds of the mark set by the Mayor. E. C. Benson captured the "show" trophy with his Apperson, handing in his card but 2 minutes 17 seconds shy of the mark.

A unique feature of the contest was that every contestant participated in the winnings, even the last to finish coming in for something. Secretary Harbach evolved the scheme, and it worked out beautifully. Those cars which finished fourth to thirteenth, inclusive, captured series A prizes; from fourteenth to twenty-fifth, series B trophies; from twenty-sixth to fortieth, series C emblems; from forty-first to sixtieth, series D prizes, and from sixty-first on, series E awards. The farther away the car finished from the official figures the smaller the value of the prize. It was a decidedly novel scheme and made a marked hit.

The Mayor distributed the prizes on Saturday evening on Young's New Million-Dollar Pier, whither the cars were taken after the run and put on exhibition. The impromptu automobile show attracted thousands of the elect who flock to the City-by-the-Sea at this season of the year.

The performance of the day par excellence was that of the brace of Woods electric coupés, driven respectively by J. C. Bartlett and George Daley. Despite a 35-minute holdup at Hammonton to enter security for having scared a horse into smashing its rig, the former brought his car to the finish in 4:35:40 on one charge of "juice"—and with about 15 miles left in his batteries. Daley did the same trick in 5 hours 12 minutes. This double performance of the Woodses is said to be the first on record in a regularly sanctioned contest in which cars of all powers had entered. Mrs. Leslie Carter, the well known actress, had her yellow Thomas Flyer in the run, and the rig, with

its uniformed crew and two pretty theatrical-looking ladies in the tonneau, made a hit. Countess Von Holstein's Oldsmobile was also a contestant. The following summary shows the order of finish, drivers and the time variation from the official figures:

Place.	Car.	Driver.	Penalties. h. m. s.
1	Rambler	Ira Brown	0:00:22
2	Pennsylvania	Richard Sellers	0:01:43
3	Apperson	E. C. Benson	0:02:17
4	Elmore	F. Hardart, Jr.	0:02:30
5	Elmore	R. E. Ross	0:02:35
6	Stoddard-Dayton	H. L. Walker	0:02:35
7	Maxwell	W. C. Longstreth	0:02:40
8	Oldsmobile	E. K. Schultz	0:03:00
9	Stoddard-Dayton	Caryl Roberts	0:03:48
10	Cadillac	F. L. Paxton	0:04:05
11	Mitchell	Jno. F. Dilworth	0:04:17
12	Apperson Jack Rabbit	Charles J. Swain	0:04:30
13	Oldsmobile	C. Edgar Shreve	0:05:23
14	Peerless	P. B. Huyette	0:05:30
15	Packard	H. M. Lyman	0:05:40
16	Oldsmobile	Wm. T. Taylor	0:05:45
17	Autocar Wagon	J. Bryan	0:05:55
18	Apperson	Dr. J. F. Sinclair	0:06:15
19	De Deltich	F. K. Stehle	0:07:35
20	Packard	H. Van Fossen	0:08:13
21	Studebaker	Frank Yerger	0:08:45
22	Apperson	A. M. Benson	0:08:55
23	Elmore "44"	George R. Harvey	0:09:07
24	Franklin	J. Chubbuck	0:09:45
25	American	W. Blind	0:09:49
26	Apperson	Mr. Foss	0:10:07
27	Rochet-Schneider	Mr. Isenberg	0:12:25
28	Midland	George P. Parker	0:13:25
29	Dragon	H. D. Jacobs	0:14:15
30	Winton Six	J. L. Brock	0:15:19
31	Stearns	G. Hilton Gantert	0:15:27
32	Stearns	F. C. Dunlap	0:15:35
33	White Steamer	Evans Church	0:17:10
34	Pope-Hartford	J. R. Maynes	0:17:44
35	Packard	A. A. Kent	0:17:45
36	Oldsmobile	L. D. Berger	0:18:12
37	Locomobile	R. S. McCracken	0:18:22
38	White Steamer	Stuart Leister	0:19:23
39	Autocar Taxicab	J. Morris	0:20:10
40	Winton Six	A. E. Maltby	0:20:15
41	Chalmers-Detroit	H. O. Brown	0:21:00
42	Franklin	W. B. Danehower	0:21:20
43	Packard	Thomas Wilkinson	0:21:30
44	Locomobile	F. L. Shields	0:22:25
45	White Steamer	A. T. James	0:22:25
46	Packard	Joe Vernier	0:24:20
47	French Berliet	W. T. Richardson, Jr.	0:24:30
48	Pope-Hartford	F. B. Shepard	0:24:45
49	American Traveler	Mr. Vogel	0:24:53
50	Peerless	J. Louchheim	0:25:45
51	Oldsmobile	J. Doe	0:26:50
52	Mitchell	F. J. Sweet	0:27:45
53	Thomas Flyer	D. A. O'Hara	0:28:55
54	Peerless	Dr. I. M. Koch	0:30:30
55	Oldsmobile	A. F. Rusk	0:32:19
56	Oldsmobile	E. Westcott	0:46:35
57	Stoddard-Dayton	W. W. Randall	0:47:44
58	Peerless	L. S. Amosson	0:48:00
59	Buick	F. K. Worley	0:48:45
60	Woods Electric	J. C. Bartlett	0:49:10
61	Thomas Flyer	J. H. Lallou	0:51:15
62	Buick	Mr. Tygert	0:56:12
63	Stearns	H. A. McNichol	1:18:05
64	Woods Electric	G. W. Daley	1:28:30

How Old Lookout Was Climbed



MILLER
(Stoddard - Dayton)
Winner Stock Free-For-All



STRANG and CHEVROLET
(Buick)
Fastest Performers



TUTTLE
(Stoddard - Dayton)

CHATTANOOGA, TENN., April 22.—Old Lookout Mountain, famous from Civil War days and known to the entire world, was conquered to-day by the men who drive automobiles and motorcycles. Yes, and more than conquered, for the cars ascended to the top of the mountain at a speed of from fifty to sixty miles per hour, rounding sixty-five turns throughout, and with grades that at times ran 30 per cent.

Fifty thousand people watched the climbing, watched for death round the "Flatiron," at the "Letter S," the "Double Letter S," the "W" turn, the "Serpentine" and the "Bridge of Fear." Some one made the trip earlier and named the points, and some one did the work well, for the names hardly convey the full meaning. The course is tortuous, the course is hard, the grades are steep, the road is none too wide at present, and none too safe.

Lookout came as a surprise to a lot of people who wanted to enter. Many came first, tried the course and backed out. Others came, saw and conquered in the end. Croakers said that deaths would result from the ordeal, but none occurred, and, therefore, the shouting of those who had the nerve to tackle the event and who won out.

To climb Lookout the start is made on the level at a point where the Southern Railroad is just constructing a road to go right through the mountain itself. The proposed bridge provides abutments that are excellent for sight-seeing. The road starts right up and goes past some splendid residences that are located at the foot. The grade is exacting and takes the wind from a few cars. Then come a lot of turns, serpentine in their way, and, suddenly, after passing along a bluff with Chattanooga in the distance, the car is driven to about as pretty a letter "S" as may be found. Many of the bluffs have been cut away to widen the road. One turn succeeds another, and each has new fears. No stretch is long and every turn has its problems. Suddenly the finish comes, also on a turn, and then the driver gives thanks that he has reached his destination; while the passenger: well, he just gets right down on his knees and talks of fate.

It all looked dangerous and had every one of the fifty thousand spectators who traveled up the hill to watch the cars go up taken a similar course of instruction, as did the writer as a passenger with Strang, the real drive would have aroused their interest to a greater extent. As it was these thousands picnicked along the course and waited patiently for each competitor to go by. The results had to be learned from the daily papers of the following morning. None on the hill learned the real time and each driver was cheered in turn, including the motorcycle men, who did the jumping-jack act as they drove their machines up the grades and over the rough going at from forty to fifty miles per hour, and at times faster.

Bert Miller and Harry Tuttle, with Stoddard-Dayton cars, were active competitors of the Buick, Locomobile and other entrants throughout the contest. Miller won out in the free-for-all stock car contest, and lost another event in all probability

for the reason that the timing tape was struck so hard when he made a flying start that it failed to record. This timing arrangement was a novelty. A white tape was stretched across the road about three feet from the ground. The cars struck the tape and released a gong which rang and was heard through the telephone at the top of the hill.

When Miller made his start in the seventh event he simply flew, and it was claimed made faster time to the bridge, about three miles up, than did any one else. From the start this bridge could be seen, and watching for the cars at this and other points as they could be seen in their ascent caused added interest at the start. Miller, after having started, could not be stopped, and so completed his daredevil effort without being timed. He demanded another trial and it was not given. His time for the eighth event, the stock car free-for-all, was doubled; in other words, being allowed for the seventh event. It brought him victory for that event, but in the free-for-all Strang and the Buick won out in 6:39.4-5.

Chevrolet negotiated the hill in 6:30 2-5 for the 4.9 miles, and this time was made at dusk. The honors for the fastest speed went to the daring French-American driver, whose daring was never to be questioned as he hurled himself at the turns, one after the other, in the fast gathering dusk, fairly pushing the returning populace off the course. The drive of the Frenchman was noteworthy, and drew admiration on all sides, especially as he had been up against the hardest sort of luck. Twice he had accidents, once a broken wheel, and another time a blowout.

The accident to Louis Doerhoeffer in his Locomobile proved a wonderful escape, as he shot into the ditch in making the "Hair-pin" and he and his mechanic were thrown out in front of the large crowd. The car was uninjured.

Strang won three of the events. Daring always, he came to look at Lookout Mountain, and after several trips said that he would make the journey so often that every step would be familiar. He did so, and his nerve was good, although to the stranger "within the ranks" his daring seemed insane. No hard luck attended him throughout the races, although he gave "fate" every opportunity.

It is now the intention of the Lookout Mountain Automobile Club to apply for a national sanction and put on a great contest

for next October, when the road will have been greatly widened, the rough spots taken out and danger spots protected. To every intent and purpose Chattanooga will aim to put forth the best hill climbing proposition in the country. Nor is it the intention of Chattanooga to do things half way. This was indicated at this meet, when the State soldiery was secured to guard the course. The soldiers used red flags for danger and white flags to announce the coming of the cars.

In Chattanooga the banks and business houses closed and it was made a local holiday. One of the local residents said that not one in four people kept away from the hill, and this is seemingly a fair statement. Nor did the people tire of the long waits for the cars, these waits being unavoidable owing to the inadequate timing arrangements.

The rain which came Thursday night, and proved a deluge, prevented any thought of the two days of track contests, and these were postponed until next week. It is improbable that many of the drivers will return, as the teams are scheduled elsewhere. The summary of the climb is herewith given:

FREE FOR ALL STOCK CARS.

1. Stoddard-Dayton	Miller	6:58 3-5
2. Buick	Strang	7:15 3-5
3. Thomas	Duffy	7:20 1-5
4. Locomobile	Doerhoeffer	Failed to finish.

STOCK CARS LISTING AT \$3,000 AND UNDER.

1. Buick	Strang	6:39 4-5
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STOCK CARS LISTING AT \$2,000 AND UNDER.

1. Buick	Strang	6:48
2. Stoddard-Dayton	Tuttle	7:49 4-5
3. Chalmers-Detroit	James	10:42 2-5

STOCK CARS LISTING AT \$1,000 AND UNDER.

1. Buick	Dewitt	6:57 3-5
2. Buick	Kenyon	11:04 4-5

FREE FOR ALL CARS.

1. Buick	Strang	6:39 4-5
2. Stoddard-Dayton	Miller	6:58 3-5

SPECIAL TRIAL AGAINST BEST TIME.

1. Buick	Chevrolet	6:30 2-5
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MOTORCYCLES, 30 1-2 INCHES AND UNDER.

1. Indian	Stubbs	6:54 1-5
2. R. S.	Moss	9:10

MOTORCYCLES, 61 CUBIC INCHES AND UNDER.

1. Indian	Stubbs	6:50 2-5
2. Curtiss	Green	7:25

700-MILE RUN OF HARRISBURG CLUB COMES NEXT

HARRISBURG, PA., April 26.—With arrangements en route completed, and the last detail attended to here, the final week before the start of the 700-mile run of the Motor Club of Harrisburg finds the club members and the officials in readiness for one of the most important events to be held in the East this year. Next Monday morning the contestants will leave the capital of the Keystone State for the national capital, crossing spurs of the mountains, through historic country, and over various conditions of Pennsylvania and Maryland roads. For four days next week they will be moving over the country under strict rules, and with experienced management, so that a remarkable endurance run is confidently expected.

Authorities all along the route have become interested in the affair, starting right here with the donation of the principal trophy by Governor Stuart, and by his starting the first car on its journey. The town and city authorities and automobile clubs along the way have been planning an enthusiastic reception, some of the places having dispensed with speed laws for the day, in case the tourists wish to show them how fast they can travel, and constables and police have been instructed to keep the streets clear. Maryland has even waived the privilege of license fees, and a government official will check the cars as they arrive in Washington. The second day the cars will return to this city via Baltimore; the third they will go up-State to Wilkes-Barre, via Sunbury and Williamsport; and the fourth they will return

via Stroudsburg, Delaware Water Gap, Easton and Reading. In addition to the Governor's trophy, there are two others of value in the respective classes, one given by the Board of Trade, and the other by the *Patriot*.

The entries have been arriving in good numbers, and it is probable that there will be 25 or 30 starters, among whom are a number who have taken part in important national events. Walter C. White will make his first appearance in competition since his accident at Cincinnati; Tom W. Berger will have a six-cylinder Oldsmobile with 42-inch wheels; C. S. Carris will be at the wheel of a Franklin; Robert Morton with a Pullman delegation; and a number of private owners are also taking part. The complete entry list has not as yet been announced. The rules provide intermediate checking stations, with a definite time schedule, observers to be carried on all cars, and penalties for adjustments, repairs and replacements. All working parts, such as bonnets, battery boxes, coils, etc., will be sealed, and technically examined at the conclusion of the run.

The officials include such experienced men as R. H. Johnston, of New York, who is the referee; J. C. Kerrison, of Boston, as starter; David Beecroft, of Chicago, as chairman of the technical committee, and J. Clyde Myton, of Harrisburg. The immediate arrangements have been in charge of W. R. Douglass, the club secretary. Dr. J. R. Overpeck is the official pilot, and he will see that the confetti is scattered each day.



By Thos. J. Fay

Automobile Gasoline and Other Available Fuel

Part III

BESIDES the volatility of automobile gasoline the viscosity, and some of the other properties of the fuel will be worthy of discussion. Considering that the relation of air to gasoline in the mixture should be held at a constant ratio, if the best mixture is to be realized, it follows that the viscosity of the fuel should be a constant if the orifice through which the gasoline flows is some one fixed size, which viscosity can only be so if the temperature is held at a constant level, and if the fuel is fixed, as to its composition and in gas form.

The viscosity of gasoline increases as the specific gravity advances, so that trouble of this nature will augment as the fuel becomes inferior in character, assuming that poor fuel is represented by the heavy fractions of the distilling process. Taking "octane" as a standard to go by for the time being, the density of which is 0.707 specific gravity and the effect of viscosity will be about as follows:

TEMPERATURE IN DEGREES CENTIGRADE.					
10	15	20	25	30	35
Relative Viscosity Considering Temperature Only.					
Unity	1.073	1.145	1.212	1.270	1.225

An inspection of the above relations will at once disclose the reason why gasoline will be deficient in a carburetor of the nozzle type, when the temperature is low, if the adjustment is made for the right fuel relation when the temperature is high. For anything like good results, it is necessary to adjust the nozzle at a fixed (middle of the range) temperature, and the same should be a good average of the prevailing range of temperatures. In the Winter time, when the temperature is low, the nozzle should be with a larger hole (orifice) than will be required in the Summer time when the prevailing temperature is higher. At all events there is no one size nozzle that can be regarded as right for all degrees of temperature, and this is one of the every day troubles that autoists have to cope with, many of whom do not well understand why their motor will run to their entire satisfaction a part of the day, and not run well some other part of the same day.

In the carbureters using a needle-valve in the nozzle, an attempt is made to get away from this very trouble, but it rarely happens that the needle-valve as usually made is so designed that it will allow of the fine adjustment which is an absolute necessity, assuming that the remedy lies in a means for altering the flow of gasoline, from time to time, as the state of the weather would

seem to require. It is even a question, that has never been adequately discussed, as to whether the needle-valve in the nozzle is really of any practical value. If it (as a device) is likely to add more trouble than it will cure, it is not a good contrivance to use. In some cases the needle-valve gives a great amount of trouble, and while it is possibly true that the difficulty might be done away with, the fact remains that it is not, and in practice, to deal with the existing conditions is a necessity.

Preheating Is One Way Out of the Trouble.—Heating the air as it leads to the carburetor is of advantage in certain ways, since it enables the gasoline, in globule form, to reduce to vapor, in the manifold to some extent, at any rate, rather than to have the globules enter the cylinders, there to form coke, and to be vaporized under conditions that can not be regarded as the most efficient. This heated air, however, will not compensate for changes in viscosity of the liquid, as it is sucked through the nozzle. The only way that the ills of viscosity can be eliminated is to heat the liquid gasoline, in the bowl of the carburetor to some fixed temperature, as is done in some cases, by water-jacketing the carburetor and allowing hot water, from the water jacket of the motor cylinders, to circulate through the same, which water should be at a constant temperature.

There is one trouble about this, but it is the lesser of the evils, since, while the water will be a little hotter than is necessary for the purpose, even so, it is possible to so contrive that the surface available will be within striking

distance of the requirements. It is not desired that the gasoline shall be heated in excess of certain needs; indeed, it is something of a disadvantage to utilize more heat than the actual demand. On the other hand, it takes quite a little heat to boil gasoline, and the right place to apply the heat is to the liquid, rather than to the mixture, after it leaves the bowl of the carburetor. True, in the case involving the use of the gas tank, in which the gasoline is reduced to vapor before it is allowed to enter the manifold at all, these vaporizing troubles are handled in the right way, in that the heat (taken from the exhaust products of combustion) is applied to the liquid gasoline in a manner sufficiently direct to serve the purpose. In this case the air drawn in is heated by contact with the surfaces of the heater, and the rich mixture should be quite free from liquid fuel. In actual practice this method shows enough economy to indicate that the reasoning is good, and that heat should be applied to the liquid; moreover, the idea is in accord with the dictates of logic.

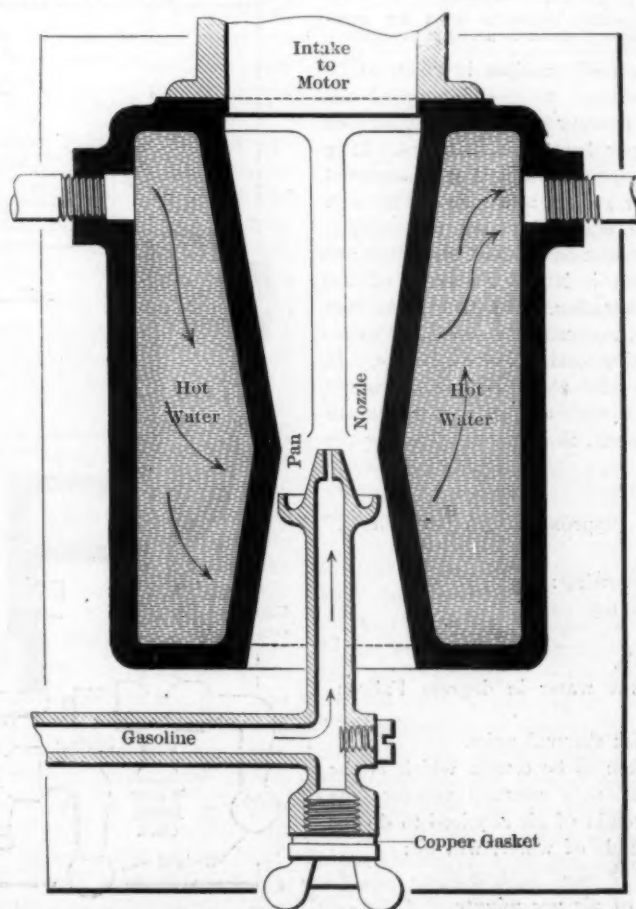


Fig. 8.—Water-jacketing the depression chamber heats the mixture instead of the liquid gasoline.

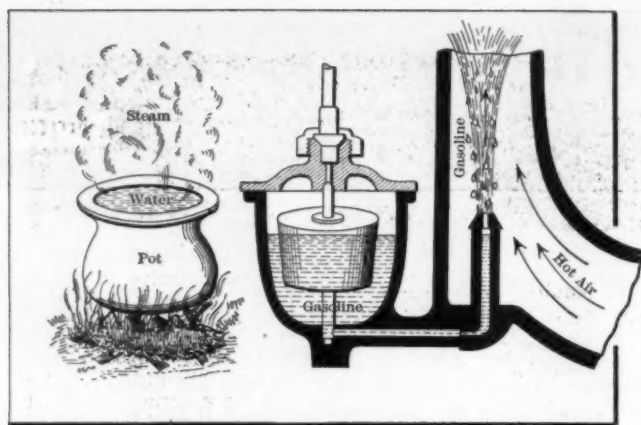


Fig. 7.—When water is boiled, a fire is built under the pot; this is the right way to boil gasoline.

The specific heat of air is taken at the low value, for the purpose of putting the error on the safe side, if one there happens to be. There is some question as to the air being at a constant volume in this service.

SPECIFIC HEAT OF GASES AND VAPORS AT A CONSTANT PRESSURE.

Substances.	Specific Heat for Equal Volumes.	Weights.
Steam	0.2989	0.4805
Oxygen	0.2405	0.2171
Nitrogen	0.2368	0.2438
Hydrogen	0.2359	3.4090
Carbon dioxide.....	0.2935	0.1952
Carbon monoxide.....	0.2370	0.2450
Air	0.1689	0.2375

SPECIFIC HEAT OF LIQUIDS AT TEMPERATURE OF MAXIMUM DENSITY.

Substances.	Specific Heat.
Water	1.00
Gasoline	0.50

NOTE.—The specific heat of gasoline depends upon its composition, specific weight, etc. The figure given is an approximation.

If the latent heat of evaporation of gasoline is taken to be 210.1 B.T.U., which figure will change, as the density of the fuel changes, it will be rendered apparent that a vast amount of vapor will have to be handled, per heat unit absorbed. If a gallon of gasoline weighs say, 5.9 pounds, and if it is assumed that a car will travel 11.8 miles per gallon, at a mile per minute, the gasoline consumption will be one-half pound per minute. This is rather a high rate of consumption of fuel, but there are cars that even exceed this, so that it is not a stretch of the imagination to use it as an illustration. On this basis, 105 B. T. U. of heat will have to be transferred to the liquid gasoline in order to evaporate it, during each minute of time. If water is used, and if the heat transfer absorbs from the water the requisite number of heat units, with a drop in temperature of the water of 20 degrees Fahrenheit, the amount of water required for the purpose will be:

$$w = \frac{105}{20} = 5.25 \text{ pounds (approximately) per minute.}$$

The reverse of this lies in the following:

$$\text{B.T.U.} = w \times t = 5.25 \times 20 = 105$$

when,

w = quantity of water in pounds,

t = change in temperature of the water in degrees Fahrenheit,

B.T.U. = thermal value in British thermal units.

If the specific heat of air is taken to be 0.1689, which is the right value for a constant volume (at a constant pressure the specific heat of air is 0.2375) the weight of air required to do the work that can be done by 5.25 pounds of water, will be:

$$a = \frac{5.25}{0.1689} = 31 \text{ pounds of air per minute.}$$

This is on a basis of 20 degrees Fahrenheit change in temperature, as was considered in the case involving water. The weight of a cubic foot of dry air at 72 degrees Fahrenheit is 0.0747 pounds, and if this weight is taken for a basis, the following will hold:

$$c = \frac{31}{0.0747} = 415 \text{ cubic feet of air per minute.}$$

If a motor with six cylinders is considered, and if the bore and stroke are taken at $4\frac{1}{2}$ inches, respectively, the cubical displacement will be 248 cubic feet per minute per 1,000 suction strokes, so that there is not enough air for the purpose, considering all the air that can be used in the cylinder in view of displacement, and, unfortunately, all the air will not brush against the walls. Indeed, but a small part of it will be available to absorb heat from the walls, particularly in view of the presence of an auxiliary air valve, which allows the major portion of the air to by-pass the depression chamber in the average carbureter. In any case, the air is not enabled to heat the gasoline excepting as it leaves the nozzle, and the time allowed is far too short to assure results.

As for the cars in which no means are provided for heating the gasoline, it is highly improbable that very much of the same is vaporized before it enters the cylinders. They properly represent the school of design, in which it is claimed that it is a matter of no moment as to how the gasoline is vaporized, and that the results are good enough when the fuel is vaporized in the cylinders instead of outside.

For the cars using hot air it will be proper to remember that, the increase in temperature assumed, i.e., 20 degrees Fahrenheit, is a fairly low value, and some of the trouble would be eliminated were the air to heat up more. On the other hand, there is small chance of all the air reaching a higher temperature, in actual practice, with the heating equipment used, and the glaring

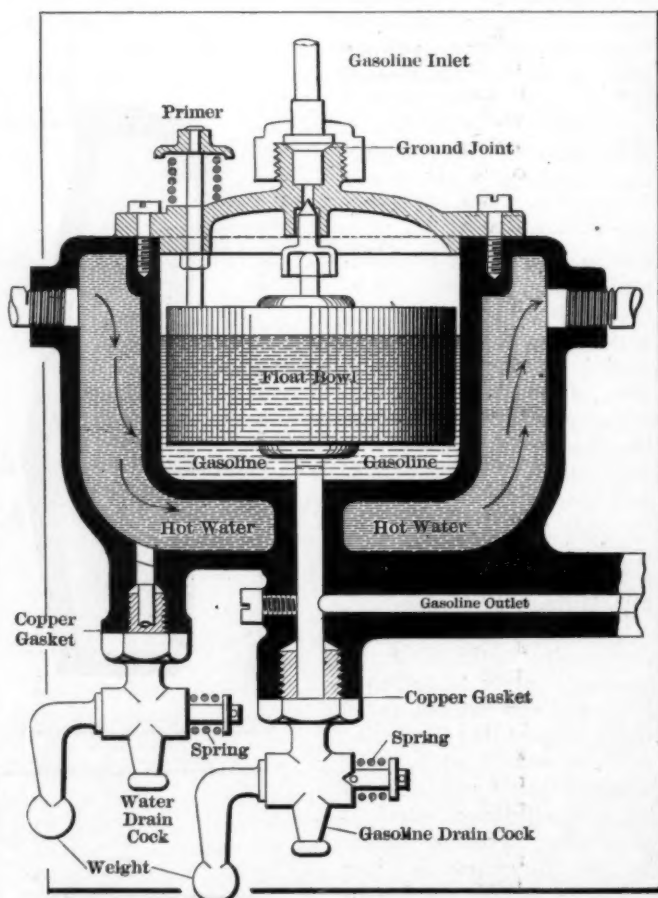


Fig. 9.—To heat the liquid, a water-jacket is placed around the float-bowl, in the manner as shown.

fact is rendered apparent, viz., the liquid gasoline is not reduced to vapor, excepting for a part, by the heated air, as it passes through the depression chamber, by the nozzle, en route to the cylinders.

The illustration is not sufficiently refined to take into account some variables as (a) the effect of diminishing the pressure, below the atmospheric, in order to induce the air into the cylinders, and to suck the gasoline out of the nozzle of the carbureter, (b) the presence of gasoline in the mixture, which must displace air. But these are all matters of small moment since they merely augment the trouble by a small percentage in that the amount of air will be less than the piston displacement represents.

The real story lies in the inability of the air to furnish an adequate amount of heat to completely vaporize the gasoline, and as a result, the gasoline must enter the cylinders, in liquid form, before it is vaporized, and since the cylinder temperature is at the "coking" point, some of the gasoline must form coke, which is a great disadvantage in practical work.

The real source of trouble then, is not the cylinder lubricating oil, but in gasoline instead, due to the very fact that the means of "boiling" the gasoline, to make vapor, does not afford enough heat to do the work outside of the cylinders, and as the temperature inside the cylinders is that which will deposit carbon out of the liquid gasoline, theory and practice are in full accord, excepting that the practical result is not wanted.

In Boiling Water Put the Fire Under the Pot.—To make steam it is necessary to boil water, and it would be regarded as a strange performance were anyone to apply the heat to the steam instead of to the water. Vapor of gasoline is no more nor less than the product of boiling gasoline, and the best way to produce the vapor is to boil the liquid, just as is done with water. Fig. 7 shows the way in which steam is made, in which a fire is built under the pot. The rest of the process is too well understood to require further discussion. A second figure in the same illustration also shows how gasoline is handled in automobiles, and it looks a little strange to apply the heat to the "spray" as it spouts out of the nozzle, in contrast with the pot of water along side of it, unless it is conceded that the old-fashioned way of boiling liquids is wrong.

Practical Devices Used in Heating Fuel.—If heat is applied to the mixture only, rather than to the liquid, Fig. 8 shows the manner in which the water jacket is contrived, in which the water is entered at one (convenient) point on the diameter, near the top of the casting, and in view of ribs that are made to serve as baffle plates, in the manner as shown by dotted lines, the water is forced down, and around, to the water outlet on the diametrically opposite side of the casting. The amount of heat that will be taken up by the gas will be limited, for the reasons as given, amongst which, as stated, the specific heat of the gas is a rather low value, and too, the surface available is restricted. True, the low specific heat of the gas is assurance that it will heat up readily, without absorbing much heat from the water in the jacket. On the other hand, the heat requirement is a definite quantity, and unless this full amount is taken up by the gas, the same will be with entrained liquid, which is not wanted, especially as carbon is likely to form in the cylinders if the liquid is not completely vaporized before it enters the combustion chamber of the cylinders, in the motor.

Water-Jacket Should Be Around the Float Bowl.—In case it is desired to take advantage of the benefits to be derived from heating the liquid gasoline, rather than the gas mixture, it is then that the plan as depicted in Fig. 9 will be the preferable one, and as shown, the water jacket is around the float-bowl, into which the gasoline enters on its way from the fuel tank to the motor. As will be observed, the water enters at the top, and if a system of baffle plates are provided, as they should be, the water will flow down, thence up, and out on the opposite side of the bowl. In view of the increased ability of the liquid gasoline to absorb heat, and in further view of the slow rate at which the gasoline flows out of the bowl, which is a condition that does not exist in the case of the vapor, the requisite amount of heat is assured,

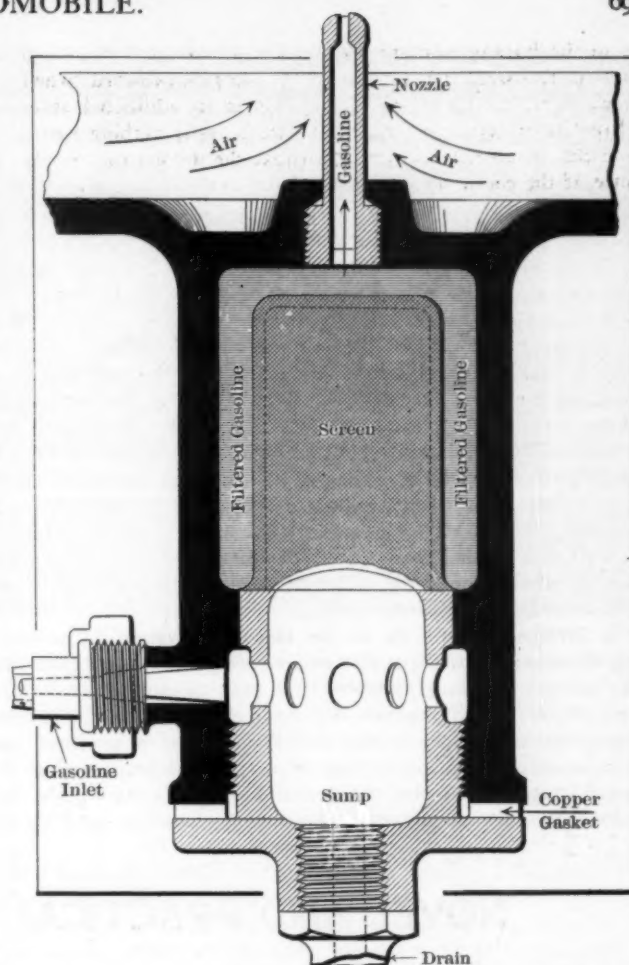


Fig. 10.—Illustrating a strainer to be placed between the float-bowl and the gasoline nozzle, in the depression chamber.

even if the difference in temperature between the water and the gasoline is not so very great. In general, the difference in temperature should be about 150 degrees Fahrenheit, and this is quite enough for the purpose, with, perhaps, a good margin.

The construction shown is more by way of a diagram, in so far as the bowl is concerned, and the float is of the direct acting genera, which is not the only kind used in practice. As will be observed, however, the needle is separate, and it is therefore self adjusting, so that if the float gets out of alignment, it will not of necessity cause the needle-valve to leak. Leaky valves cause much trouble in practice, due to the use of inferior material in some cases, and to the form of construction, in which the system gets out of alignment, or sticks. For the needle, it is believed that German silver is the best, although it is difficult to procure, which is the main reason why soft brass rod-stock is more often than not used for the purpose.

The float should be of "spun" copper, rather than of cork, and if cork is used it is a moral certainty that it will lose its buoyancy before very long, in actual service. If the float is of copper, it can be adjusted to the conditions, without resorting to the use of means for changing the adjustment at will, and in this practice there is nothing to shift, so that, once the adjustment is right, it will stay so. It is not uncommon, in connection with carburetors, to observe that the cocks are of the sort usually found on gas fixtures and on other work in which the ills of vibrations are not figured upon. For carburetors it is scarcely to be expected that the ordinary form of cock will do the work without giving a certain amount of trouble, and the form of cocks shown are certainly better, in that they are provided with a spring-locking device, so contrived that the cock can not jar loose. The lock consists of a pin in the stem of the valve which engages a nick in the housing. When the valve is turned the spring compresses enough to allow the pin to slide out of the

notch in the housing without any trouble at all. The crank on the stem is also weighted, and the weight hangs downwards when the cock is in the closed position. This is an additional safeguard that is of good value, and the cost is really nothing extra. If all cocks are so devised, it is then that the autoist can see, at a glance, if the cocks are opened or closed, and in the dark, it is only necessary to feel the position of the crank on the cock, to be able to tell if it is opened or closed.

In the future, it is a moral certainty that the fuel question will become sufficiently acute to require that every known means will be provided, in order that the gasoline may be quite completely vaporized, and with this contingency in mind, it may be that the question of the water-jacket is one to be discussed on a basis of jacketing not only the float-bowl, but the depression-chamber as well. There can be no possible objection to the extension of the jacket to include the depression-chamber, especially if, in the course of events, fuel becomes less volatile than it is at the present time, although it is a sad condition to contemplate. Should it be desirable to jacket around the mixture, as well as around the gasoline in liquid form, it will be the right plan to take advantage of the methods shown in both Figs. 8 and 9, combining them for the purpose.

A Strainer Should Be in the Gasoline System.—Considering the diameter of the nozzle orifice, even in the cases involving the use of very large motors, it is easy to understand how a little slime, or hard paraffine, will serve as the nucleus for further accumulations of such matter as will be found in gasoline, and Fig. 10 shows a strainer such as should find lodgment in the system, between the float-bowl and the nozzle. As will be observed, this device, as shown, requires the liquid to enter to the

inside of the strainer, the object being to assure that the accumulations will be withdrawn, with the strainer, when the same is removed for the purpose of cleaning. It will also be observed that there is plenty of room in the well for the strainer, and a good space is allowed between it and the walls of the housing. In some of the earlier types, it was the custom to afford but little room between the walls and the surface of the strainer, with the result that jelly formed readily, and when the strainer was removed for the purpose of cleaning the jelly failed to come out, but after being loosened up it would float up to the nozzle and cause stoppage of the fuel at frequent intervals until it became an argument in favor of a design such as would not allow the jelly to collect on the inner wall of the well.

Why Hot Air Will Not Best Serve the Ends.—It is really necessary to heat the liquid gasoline, just as it is proper to heat water to cause it to boil. It would seem to be just as good practice to try to heat steam to make the water from which it is made, boil, as it is to heat mixture in the intake of the motor, in order to cause the liquid gasoline to boil off as it oozes out of the nozzle. Hot air, drawn in through the primary air-take, while it does afford a measure of benefit, is representative of a most indirect way of doing that which can be done directly. True, there are ingenious devices in vogue, by means of which the heat is applied with good effect, particularly when the gasoline is of a desirable quality. The time is fast approaching, however, when even a fine display of ingenuity will fail, in a measure, at any rate, to deliver enough heat to the fuel, by any indirect process, and it is believed that the water-jacket method will find many converts.

(To be continued.)

NOVEL AND PRACTICAL SYSTEM OF CAR RENTING

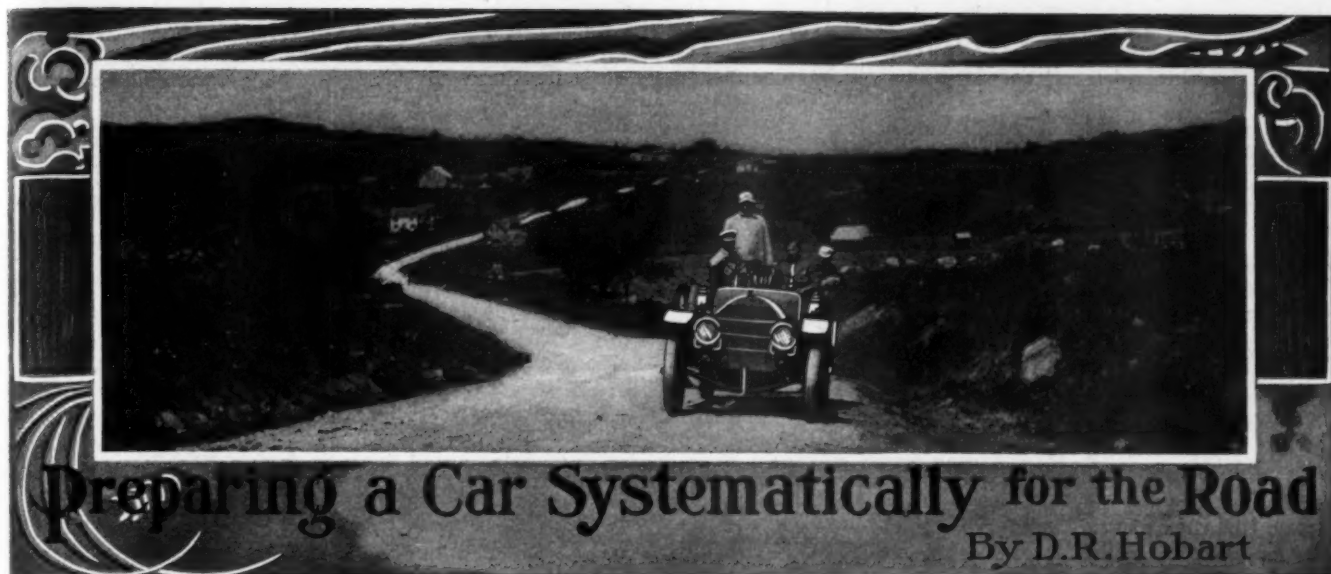
THE majority of garages rent an automobile by the day rate or hour rate alone, the usual charges for the day being from \$25 to \$35 for a five to seven-passenger car, whether the customer uses the car a full day or not. The length of the day varies also, some garages reckoning eight hours to the day, while others reckon twelve hours. No record of mileage is kept, and should the car need repairing on the road no deductions are made from the charge. Hour rates vary from \$3 to \$5, and at hour rates the customer is also deprived of the use of the car when repairs are being made. It is customary to either collect the charges in advance or have the customer pay the driver on giving up the car. Under these circumstances charging by the day or hour is unfair to both the customer and the garage, in charging the former for service he does not get, and in putting the latter at the mercy of an unscrupulous driver, who can pocket a proportion of the hire by claiming that part of the time was employed in repairs, or that the customer discharged the car sooner than he expected. Again, if no mileage record is kept, the profit or loss on each car rented is difficult to determine.

To give fair treatment to the customer and at the same time to protect the garage, the Central Auto Station Company, Pittsfield, Mass., rent their cars out on a mileage or hourly basis, the maximum total prevailing. The cars are fitted with clock, and season and trip odometers, and before leaving the garage the time and mileage odometer readings are entered on a rental slip, along with the name of the car and the driver's and customer's names. If the car is run steadily, the mileage rate as indicated by the odometer of 25 cents a mile is charged, but if the car is kept waiting, the hour rate of \$3.50 prevails. Should repairs be necessary on the road, the elapsed time is deducted from the hour rate. When the trip is finished the odometer and clock readings are again taken at the garage and entered on the rental slip, a specimen slip being shown in the accompanying illustration. The bill is then made out from this slip and delivered to the customer. It will be seen that the route is also marked on the slip, and that the slip acts as a check on the driver and customer,

and is conclusive proof in case of a dispute. The system is working with great success, and is well worth universal adoption by concerns desiring to embody the latest methods.

CENTRAL AUTO STATION CO.	
PITTSFIELD, MASS.	
RENTAL SLIP No. 17	
Date <i>April 20 '09</i>	
Car <i>Stroms -</i>	
Odometer Out <i>1061-5</i>	In <i>114116</i>
Trip Odometer Out <i>0</i>	In <i>80.1</i>
Clock Out <i>1:00 Pm.</i>	In <i>5 Pm.</i>
Total Mileage <i>80.1</i>	@ .25 <i>20⁰⁰</i>
" Hours <i>4</i>	@ 3.50 <i>14⁰⁰</i>
Driver <i>Smith</i>	
Route <i>No. Adams, Williamstown</i>	
Customer <i>McBrown</i>	
<i>Bill #11672</i>	<i>20⁰⁰</i>

Rental Slip That Admits of No Argument.



Preparing a Car Systematically for the Road

By D.R. Hobart

SYSTEMATIC procedure in preparing a car for the road and in attending to its wants during the trip will result in the necessary attentions soon becoming second nature to the operator, with the result of keeping the car in good condition. It is a well-known fact that most of the trouble occurring to automobiles come from negligence, outside of careless driving. Given a careful driver and proper attention, there is no reason why the life of a motor-driven vehicle should not be measured in years instead of months, as is too often the case.

Commencing Operations, Filling and Oiling.—The autoist, when commencing his preparations of the car for the road, should start by filling the water tank, which in most cars is combined with the radiator, with absolutely clean water.

After doing this, the pipes carrying the water to and from the radiator should be examined for leaks and the grease-cup on the pump screwed down one turn. The fan-belt should then be tested for tightness and the fanshaft oiled.

Then, beginning with the starting crankshaft and the front springs, and moving toward the rear of the car, every oil cup and hole should be liberally fed with oil and every grease cup screwed down one turn, not forgetting the gear shifter shafts and the brake shaft. As the oiling progresses, every moving part of the mechanism should be inspected, the steering linkage being tested for looseness, the clutch operated to "work in" the lubricant, and the spark and throttle levers and the pedals worked to and fro to loosen them up and distribute the oil. It would be well for the autoist to have a plan-view of the car with all oil cups and grease cups marked so as to facilitate the oiling operation.

Lubricating Oil Is Infinitely Cheaper than Worn and Broken Machinery.—Should a nut or bolt be found loose during the oiling, it should be tightened at once and not left until later on, as it may be forgotten, with disastrous results. To most people the number of places to be oiled seems too great, but as a matter of fact the complete oiling of a car takes but a few minutes and more than repays for the time spent in the longer useful life of the car.

Examining Tires and Springs, and Cranking.—The tires should be examined for cuts and weak spots, and if likely to cause trouble on the road should be changed. A glance at the springs will show if any leaves are loose or broken, and the nuts holding the spring clips should be tried with the fingers for slackness.

The gasoline tank can now be filled, the spark retarded and throttle partially opened, and the gear-shifter lever placed in the neutral position. The hand brake should be put on and the motor turned over by the starting crank.

In cranking a motor the autoist should grasp the crank handle with the left hand and hold on to the right dumb-iron with the

right. He is thus enabled to exert more power on the handle, and in case of a back-fire will not be injured, the fingers being merely thrown open as the handle moves downward. When a back-fire occurs when cranking with the right hand, the autoist is lucky to escape with a wrenched arm or a cut or bruises, as the position is awkward and the body is out of balance.

With battery ignition the spark should always be retarded on starting the motor, but with magneto ignition, which is in use on a large majority of cars to-day, the spark is fixed, or, if not, should be somewhat advanced.

Note Action of Motor and Lubricator.—Having started the motor, the autoist should listen for any unusual sounds while it is running and also closely watch the sight-feeds on the lubricator, adjusting them if necessary.

If the car is likely to be out after dark, the acetylene generator should be provided with carbide and the lamps filled.

If a gas tank is used instead of a generator, the autoist should see if the pressure gauge indicates that there is sufficient gas in the tank for the trip, and, if not, the tank should be replaced by a charged one.

In connection with filling the lamps it would be well to form the habit of wiping the tail-lamp glasses and the license-plate with a cloth, as these are usually neglected and become obscured by dirt, and may subject the autoist to arrest for not having a rear light or an illegible license-plate.

Trying Out the Car.—The autoist should now take his seat, and, withdrawing the clutch, place the shifter lever in the position for first speed, release the brakes, and start the car by engaging the clutch gradually.

While the car is moving the brakes should be operated, first the hand brake and then the foot brake, and if any adjustments are needed they should be made at once. A trial of the brakes with the car running is more valuable than a number of trials with the car at rest.

If the gear shifter lever does not work properly or the clutch slips, the fact will be indicated and adjustments made on the spot, saving the autoist trouble and humiliation on the road.

Easy Means of Remembering Procedure.—If the above method of procedure is followed, it will be surprising what a short space of time will be consumed in preparing the car. As an aid to memory, the words WON'T GAT can be used, the initial letters of words describing the various operations being employed, thus:

Water.
Oiling.
Nuts and bolts.
Tires.
Gasoline.
Acetylene.
Trying-out.

ITALIAN INSTRUMENT FOR MEASURING CYLINDER BORES.

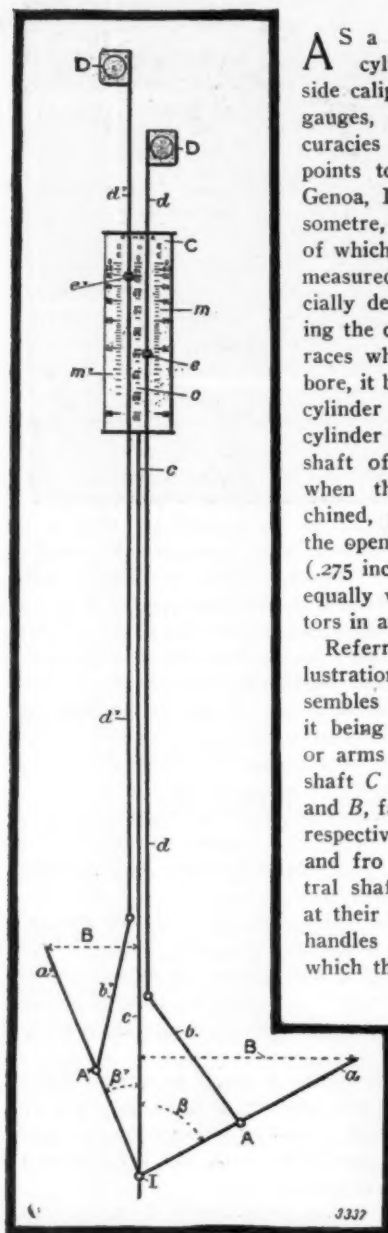


Diagram of Alesometre, Showing Operating Scheme.

Diagram and also the angles β' and β which the "ribs" or arms A and A' make with the central shaft. The graduations are placed upside down so that the operator can read them by slightly

As a rule the bore of a motor cylinder is measured with inside calipers, or in some cases star gauges, and to prevent the inaccuracies due to applying the caliper points to a scale, M. Paradis, of Genoa, Italy, has invented the alesometre, an instrument by means of which the bore can be accurately measured. The instrument is specially designed for use in measuring the cylinders of motors used in races where the classification is by bore, it being readily inserted in the cylinder through the opening in the cylinder head through which the shaft of the boring tool projects when the cylinder is being machined, provided the diameter of the opening is not less than 7 mm. (.275 inch). It is obvious that it is equally valuable for use by inspectors in automobile factories.

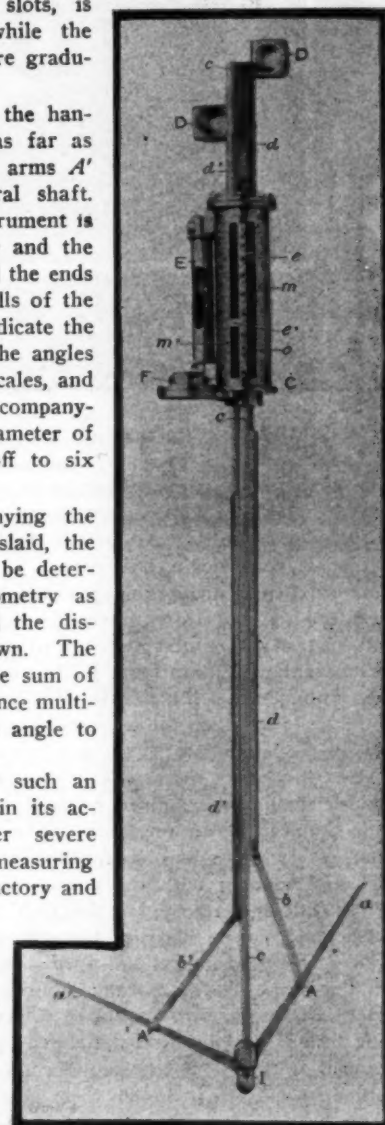
Referring to the accompanying illustrations, the instrument resembles the frame of an umbrella, it being provided with two "ribs" or arms A' A pivoted to a central shaft C and controlled by links B' and B , fastened to sliders D' and D respectively. The sliders work to and fro in grooves cut in the central shaft and are reduced in size at their upper ends and fitted with handles D' and D , by means of which they are moved by the operator. A cylindrical casing C is fastened to the shaft and is slotted to allow pointers E' and E to move with their respective sliders when the handles are operated. The cylinder is graduated on its front face, the positions of the pointers indicating the distances $B-B$ in the dia-

inclining his head, and not disturbing the adjustment of the instrument. Two spirit levels E and F are fitted to the cylinder, one for vertical and the other for horizontal use. The central scale, between the two slots, is graduated in degrees, while the outer scales M' and M are graduated in millimeters.

To use the alesometre, the handles are pulled upward as far as they will go, folding the arms A' and A against the central shaft. The lower end of the instrument is inserted into the cylinder and the handles pushed down until the ends of the arms touch the walls of the cylinder. The pointers indicate the distances $B B'$, and also the angles β' and β directly on the scales, and by referring to a table accompanying the instrument the diameter of the bore may be read off to six decimal places.

If the table accompanying the alesometre should be mislaid, the bore of the cylinder can be determined by simple trigonometry as the angles β' and β and the distances B' and B are known. The bore would then equal the sum of the products of each distance multiplied by the sine of the angle to which it corresponds.

It is doubtful whether such an instrument will long retain its accuracy under the rather severe usage usually given to measuring instruments both in the factory and at the track. It will be noticed that there are five joints in the instrument, and no provision for the inevitable slackness is made, so that measurements will sooner or later become unreliable. As the graduations are only in millimeters, it will be impossible to make as accurate measurements as with micrometer calipers, and cylinder diameters slightly over or under the even millimeter cannot be detected with accuracy.



The Paradis Alesometre in Operating Position.

IRREVERSIBLE STEERING EXPLAINED.

The question is often asked, what is irreversible steering? This cannot be explained in a word. The first form of steering arrangement consisted of a series of arms and linkages. In extreme cases it was possible to so place the steering lever that road obstructions would turn the wheels out of their position, even against the driver's exerted strength.

The modern form of steering gear is such that this is impossible. The mechanism used differs from the old form. Moreover, it is self locking. The usual form of this is the worm, which, of itself, may not be forcibly reversed from the road end of the steering arrangement.

WHEN A LAMP GLASS BREAKS.

When the tail-lamp glass breaks, red tissue paper bought from a stationery or toy store can be substituted, the paper being either tied round the lamp with string or fitted into the frame which held the glass. As there is no head draught on the lamp, this "wrinkle" is perfectly feasible. If a sheet of paper such as is wrapped around butter can be obtained, it can be fastened on with wire after doubling it and greasing it, coloring with red ink or dye. This can be used for head and dash lamps also without coloring the paper, of course. A handkerchief can also be used, and if none are lost the glass can sometimes be held together by adhesive plaster.

Information for the Man Who Drives

Caring for Acetylene Lamp System.—As there is little night running during the winter months, the acetylene lighting system is more or less neglected, the generator being left with stale or partially used carbide in the chamber, and the residue being allowed to clog up the water port and the waste ports. The rubber lamp connections and gas-bag suffer also by deterioration as well as the burners and gas valves. For the proper maintenance of the system, strict cleanliness should be maintained at all times and the various parts should be examined and replaced from time to time as necessary. The results of neglect are seen every spring in lime deposits which have to be removed by means of a cold chisel, in porous connections and in clogged burners which resist the cleaning wire and necessitate the scraping of the burners. By following the accompanying directions, the automobilist can depend on having his lighting system in good shape whenever he desires to use it.

Care of the Generator.—The interior of the carbide chamber or basket is more or less in contact with the water distribution apparatus and the parts of both apparatus are liable to clogging by the formation of lime residue in the generation of gas. If this residue is allowed to collect, it will have to be removed with a chisel, which is a ticklish operation in a light construction like that of a generator, especially around the water valve or its outlet. Acids are sometimes used to remove the deposit, but as they eat the metal, their use should be prohibited. The basket and pot should be thoroughly washed out after each run with water, the water outlets being cleaned with special brushes, when these are obtainable, or by wires, removing all traces of lime. The water valve should be scraped and tested to see whether it seats properly, care being taken not to damage the valve or its seat in so doing. While the valve is dismounted for cleaning it would be well to see that its stem is straight and that it works with some ease in the threaded portion attached to the water chamber. The gas valves should be cleaned and should seat snugly, so that there will be no leakage past them. This applies also to the gas valves on the lamps.

The best position for the generator is on the runningboard just back of the change-gear quadrant, and sufficiently far out from the frame to allow a free circulation of air all around it. The generator will keep cool in this position and will perform its work to the best advantage when properly cooled.

The Much-Neglected Condenser.—When used at all, the condenser or its substitute is put off in some position where it becomes caked with mud and is almost forgotten until it is full and the lamps begin to flicker. Then the mud is cleaned from it and it is drained out. It should be placed so that it is close to the lamps, where it will catch all of the condensation from the gas going to the burners, and in addition any water that may enter the burners due to washing of the car. It should be emptied from time to time, say once or even twice a month, when the lamps are in regular use. The majority of troubles with acetylene lamps are due to lack of a condenser and to the use of too small metal tubing.

Regarding Tubing and Gas Bags.—Copper tubing is considerably used for piping the gas to the burners, but it is liable to erosion by the gas, and standard 1-8-inch gas pipe is better and lasts longer. The gas bag and rubber lamp connections should be kept clean and not painted, as is often done to correspond with the car, as paint rots the rubber, with the result that it is soon unserviceable and must be replaced. When the rubber is to be washed, only water should be used and the goods should be carefully dried before putting them in service again.

Care of the Lamp.—It goes without saying that the burners should be kept clear, wires being passed through the gas apertures and the air apertures at intervals. The burners should be unscrewed occasionally and blown through, and the interior of the burner body scraped clean of deposit. Outside of keeping the lenses and glasses bright and polishing the exterior of the lamp, there need be no other attention paid except to keep all joints and the bracket screws or nuts tight.

To Avoid Clutch Trouble.—One of the greatest sources of trouble for the novice lies in the clutch. This may be just right, it may be slipping or it may be what is called fierce. The second manifests itself in such pleasant situations as climbing a hill when, with the engine running at its highest speed and the proper gear engaged, the car starts to run backward instead of forward. Or on the level, with the engine racing and the high gear in, no speed results.

The last condition shows itself in the sudden jumping forward of the car when the clutch has been let in, or it may even be so severe as to shear off the bevel driving gear when used with studded non-skid tires or any form that will not slip easily.

To repair the first, look at the leather, if this is all in good shape with an apparently good surface, but has lubricating oil on it, wash the surface well with gasoline. It is not a bad idea to roughen the surface of the leather a little with a coarse file.

The harsh or fierce clutch is remedied by the application of a proper oil for this purpose. Castor oil is universally used and a good way is to soak the complete clutch in it over night. This will cure a case of harsh leather, but it may be that the trouble is only a lack of adjustment of spring tension. Usually there is an adjusting nut and a locking nut. Back off the latter and make an adjustment. Then tighten the lock nut to retain it. For the beginner, it is better to adjust a little at a time and make several successive jobs of it than to try to do it all at once. But always adjust it as soon as possible.

The Proper Care of Chains.—The owner or driver of a chain-driven car should learn very early in his driving career to care for the driving chains in a proper manner. While chains have been known to run an entire season without any care or additional lubrication, this practice is deprecated. To care for a chain properly, one should get into the habit of lubricating every so often and so time these intervals that they occur before the chain is in need of the oil. In addition to this regular lubrication, there should be some set time at the end of which the automobilist takes the chain off, cleans it thoroughly, and inspects it to detect faults.

A month is a good length of time for this, and an excellent way to proceed is to take the chain off and throw it into a pan of kerosene. In the morning, all of the dirt will have passed from the chain to the liquid and can be found in the bottom of the pan. Take the chain out and throw the liquid and dirt away. Then clean the pan and in it wash off all traces of the kerosene with gasoline. Having done this, hang the chain up to let the gasoline evaporate.

The chain then will be both clean and dry. Now inspect all rollers, links, rivets and bushings, taking note of any unusual wear as indicating by looseness or play. If defects are found, they should be remedied. Then, having the chain clean, dry, inspected and passed upon as O K, an excellent method is to soak it, or, better, boil it in a heavy melted lubricant. The best quality of beef tallow mixed with a little graphite is good. Many do not like the latter, in which case a high-grade oil may be substituted for the purpose.

COMPOSITION OF COMMERCIAL PETROLS.

By BERTRAM BLOUNT, F. I. C.

Since the modern automobile came into use the nature of the fuel has been a question of much interest, leading to many tests. Originally the specific gravity was measured with a hydrometer, but this was soon abandoned as valueless. Many drivers have a lurking doubt about the quality of their fuel and as soon as trouble crops out blame the petrol. In an endeavor to prove or disprove this, the writer purchased in London a number of samples of seven different brands, all in sealed cans. Thus it may be taken that it was such as the producers habitually make.

The samples were examined by the usual fractional distillation, and their specific gravities and those of their fractions were determined. In addition, a certain number were analyzed for sulphur, and one or more examples of each brand were burnt in a calorimeter. The results are shown in the table.

It is often supposed that the calorific value varies with different origin or quality, but in fact the variations are small. This refers to a given *weight* of the fuel; by volume there is a considerable difference owing to the different specific gravities of petrols. The calorific value stated in calories per liter and in B.T.U. per one-tenth of a gallon indicate this, and show that as long as petrol is sold by measure instead of weight an appreciable advantage is secured by buying the heavier grades, provided they can be burnt efficiently.

The determination of the calorific value was a matter of difficulty. A bomb calorimeter was used which, though easy to manipulate when solid fuels are burnt, needs special handling with a volatile liquid like petrol. In spite of the fact that there is an excess of oxygen at a pressure of 25 atmospheres, complete combustion was difficult to secure. Moreover, the explosion was so violent as to shatter the platinum cup in which the petrol was contained. After many trials the petrol was enclosed in a relatively deep cup provided with a celluloid envelope rising above the edge and contracted at the top so as to form a sack with a relatively narrow mouth. By this means the vapor was confined sufficiently to cause it to burn at a moderate rate and imperfect combustion and violent explosions were avoided. The percentage of sulphur in all cases is so small as to be without practical significance. The petrol engine is free from this drawback which occurs with coal.

The remaining figures are worthy of study. It may be noticed that the specific gravity of any given brand varies within comparatively narrow limits save in cases where there are two grades. The percentages distilling within limits are less regular, but the variations are moderate, and not greater than might be expected with a commodity which is of a very complex mixture.

Three of the brands present so general a similarity that they may be grouped and their average composition compared.

	Pratt.	Shell.	Carburine.
	Per cent. by volume.		
Below 100° C....	65.0	66.6	66.5
100 to 120° C....	24.8	23.9	23.7
120 to 133° C....	6.0	5.0	5.8
Above 133° C....	3.0	3.1	2.8
Loss.....	1.2	1.4	1.2
	100.0	100.0	100.0

The resemblance is sufficiently close to make possible a specification for petrol filled by all three brands, thus freeing the consumer from the obligation to buy any particular one and allowing that each may be employed as convenience may dictate.

The other brands differ too widely to admit of grouping, but comments may be permitted. Anglo "760," which has a specific gravity of 735-740, is in a class by itself. It differs from the foregoing in the small fraction distilling below 100 deg. Cent., and the middle fraction coming over at 100-120. The succeeding fraction from 120-133 is large, but the tailings (distillate above 133) are as small as those brands discussed.

Carless's "standard" is the lightest of those examined, 86.5 per cent. distilling below 100 and 98 per cent. below 120. Like Anglo, it stands in a class by itself, and is similar to the petrol of the days when .68 was desired and .70 was an upper limit. If fuel like this is desired a different specification is necessary.

TABLE SHOWING THE RESULTS OF AN EXAMINATION OF SAMPLES OF SEVEN DIFFERENT BRANDS OF PETROL.*

SERIAL NUMBER.	TRADE NAME.	Specific gravity.	Distillation: Began to distil at.	Distillate below 100° C. %	" 100° to 120° C. %	" 120° to 133° C. %	" above 133° C. %	Loss.	Calorific VALUE: Calories per litre.	" " kilo.	B. T. U. per 1-10 gallon.	" " pound.	Sulphur
1	Anglo "760"	0.739	70°C	39.0	0.722	48.0	0.727	747	8249	11162	14848	20092	0.03%
2	Shell	0.717	65°C	65.5	0.708	69.0	0.707	743	8068	11252	14522	20254	0.06%
3	Pratt's Motor Spirit	0.717	65°C	70.0	0.710	71.0	0.710	710	8051	11229	14492	20212	Trace
4	Carless "Standard"	0.700	56°C	59.0	0.700	66.0	0.700	731	7911	11302	14240	20344	0.06%
5	Shell	0.716	63°C	65.0	0.704	67.0	0.706	742	8056	11267	14501	20281	0.07%
6	Pratt's Motor Spirit	0.711	60°C	66.0	0.700	70.0	0.710	710	8017	11260	14431	20268	
7	Carless "Capel" "Movril"	0.718	63°C	59.0	0.704	64.0	0.705	68.0	8042	11200	14476	20160	
8	Shell	0.716	63°C	65.0	0.704	67.0	0.706	742	8056	11267	14501	20281	0.07%
9	Carburine	0.717	65°C	64.0	0.705	68.0	0.703	67.5	8021	11187	14438	20137	
10	Carburine	0.717	65°C	64.0	0.705	68.0	0.703	67.5	8021	11187	14438	20137	
11	Pratt's "Perfection"	0.710	58°C	68.0	0.699	68.0	0.699	86.5	7911	11302	14240	20344	0.07%
12	P. G. R.	0.715	58°C	68.0	0.700	73.0	0.697	74.0	8056	11267	14501	20281	0.07%
13	P. G. R.	0.705	55°C	68.0	0.700	73.0	0.697	74.0	7919	11289	14326	20320	0.06%
14	Anglo "760"	0.736	70°C	48.0	0.727	48.0	0.727	747	8249	11162	14848	20092	0.03%
15	Pratt's Motor Spirit	0.715	63°C	66.0	0.701	70.0	0.710	710	8017	11260	14431	20268	
16	Pratt's Motor Spirit	0.712	63°C	62.0	0.699	68.0	0.699	86.5	7911	11302	14240	20344	0.06%
17	Shell	0.719	60°C	67.0	0.706	70.0	0.710	710	8051	11229	14492	20212	Trace
18	Carburine	0.717	63°C	67.5	0.706	68.0	0.703	67.5	8021	11187	14438	20137	
19	Russian Petrol	0.705	60°C	68.0	0.700	73.0	0.697	74.0	7919	11289	14326	20320	0.06%

*Petrol is the English term for all petroleum products, suitable for use in internal combustion engines and is comparable with the word gasoline, extensively used in the United States, or the word essence, which the French apply to the engine fuel. The word petrol is a very logical one, being derived from the word petroleum, from which the fuel is obtained by distillation.

Letters Interesting and Instructive

CAR HARD TO START.

Editor THE AUTOMOBILE:

[1.852.]—I have a two-cylinder 1907 model which, after giving much good service, has begun to get freakish. It runs well at times, but overheats so badly that it is necessary to fill it with water every twenty miles. Also the engine is very hard to start. Can you suggest anything which will overcome this?
G. H. G.

New York City.

Your machine is probably in need of a general cleaning and overhauling; carbon deposits in the cylinders, scale and mud in the cooling system will doubtless be found responsible for both the failings you mention. As in this car, the entire power plant is hung on the frame by bolts in the ends of the cylinders, it will be a somewhat lengthy process to take these off for cleaning, and a better scheme will be to use one of the decarbonizing fluids on the market. Fill the cylinders with this through the spark-plug hole, making sure that the compression cocks are closed, and let it stand over night. In the morning the greater part of the fluid will be found in the crankcase, whence it may be drained off, as well as through the compression cocks. Put plenty of oil in the crankcase before starting again.

The cooling system can be effectively cleaned with kerosene, which will loosen up the scale. The hose connections had better be removed, to be replaced with new ones, and the openings stopped with corks before pouring in the kerosene. This, too, should be allowed to stand over night. After the engine has been cleaned out in this way a new adjustment of the carbureter, effected by the air lever under the steering wheel, will probably be found advantageous.

WHY PNEUMATIC TIRES?

Editor THE AUTOMOBILE:

[1.853.]—Will you please inform me through the columns of "The Automobile" why the pneumatic tire is used on automobiles in preference to solid rubber?

A. B. LANGWORTHY.

Soldiers Home, Cal.

The pneumatic tire is used to secure a desirable spring effect, and to reduce the vibrations. The former is in addition to the usual body springs, which as yet are not perfect. The springs also absorb some, but not all, of the vibrations set up by the rapid passage of the car over road surfaces which are far from even. The pneumatic tire, properly filled with air, possesses the much-desired quality known as resiliency. The air-filled tire has the two additional qualities: first, yielding to or swallowing up small obstacles, and, second, obtaining a better grip on the road. The former is very desirable because it does away with much of the lifting up of the wheel in passing over obstacles. It there-

fore makes the car, so equipped, ride easier.

The ability to take a better grip upon the road allows, in addition, greater speed than could be obtained with the heavier and less resilient solid tires. As to the weight, inflated pneumatics would weigh about one-third of the solids, so when reducing the weight as low as possible, why add this weight unless there are some advantages to counterbalance it?

On the other hand, the solid tire has a number of undeniable advantages, such as the freedom from punctures, and the attendant saving in worry. This is, however, being minimized by the use of demountable rims and tires.

AUTOMOBILE SCHOOLS.

Editor THE AUTOMOBILE:

[1.854.]—What good schools are there for learning the mechanism of the different making of automobiles and the ways of operating and repairing them? How long are the courses and what is the cost?
Albion, N. Y. DAN BULLARD.

Aside from the correspondence schools, of which there are a number, you would probably get more from a school in which the practical workings were emphasized. If you are in a position to come to New York City, there are several excellent automobile schools here, one of which would doubtless suit you. The Y. M. C. A. maintains such a school at its Fifty-seventh street branch. The cost of the course at this school is about \$50. It may be completed in either four or eight weeks. In the former case, there will be four shop periods of three hours each and two road lessons of one hour each, per week. In the longer course these are just halved, that is, two shop and one road lesson per week.

TO CORRECT A MISS.

Editor THE AUTOMOBILE:

[1.855.]—My car, a four-cylinder model, misses persistently in one cylinder, especially at low speeds. I have changed spark plugs, inspected the high-tension wire and adjusted the vibrator, but without results. The car has been in use for little over a year and is otherwise in good condition.
Brockton, Mass. PUZZLED.

Such a miss as you describe is as likely to come from an air leak into the inlet as from the ignition, and since you have gone over the latter so thoroughly it will be well to try the former. In case the cylinders are separate, or if there is a separate branch of the inlet pipe for each cylinder, the leak will probably be found where the pipe bolts on to the cylinders. A new gasket is the remedy. It is also possible that the leak may be around the valve stem. In this event a new valve stem guide should be provided. Or, if the valve guide is integral with the cylinder casting, it may be bushed.

TRANSMISSION TYPES AGAIN.

Editor THE AUTOMOBILE:

[1.856.]—Will you please inform me through the medium of "Letters Interesting and Instructive" what is the difference between the selective and progressive types of transmission?
Longmont, Colo. A READER.

The difference between the selective and progressive transmission is mainly a difference in the method of operating the speed changes. In the former the operator may select the speed desired and change to it at once without passing through any other speed. With the progressive type the continuous or progressive movement of the gear-shifting lever gives in succession the speeds from the lowest to the highest. In this form, if the low speed is engaged, and the high is desired, it is necessary to pass from low to second and then to high. If there are four speeds, from low to second, second to third, and third to high.

CYLINDER OIL TESTS.

Editor THE AUTOMOBILE:

[1.857.]—Would you kindly answer through "Letters Interesting and Instructive" what is one of the best ways to subject cylinder oil for an automobile to a fire test, and what is the requisite test for a good oil.
Independence, Kan. L. V. STANFORD.

There are really two parts to the fire test, as it is called. One is the test for flash point. This may be determined as follows: Take two pieces of glass of the same size and large enough to cover a small glass beaker. In one of them cut a couple of notches. These are for two purposes. One is for the thermometer and the other for the flash point determination. Insert a thermometer in the beaker, filled with the oil under test. Place the notched glass over this and the other piece of glass over that, taking care to cover the notch not in use. Now uncover this notch, note the temperature, and apply a lighted match to the opening. If nothing results, warm the oil slowly over a flame to a higher temperature and take another trial and reading. Continue the test until upon the application of the lighted match the oil vapor over the oil flashes. The thermometer reading at that point gives the flash point. The glass plates may now be removed and heating continued. The match is applied at similar intervals, until finally the oil burns, which will usually occur at about 50 degrees above the flash point.

An additional test is for precipitation at a known temperature. This is also made in a beaker. Two ounces is the usual amount. It is heated to the desired temperature, at which the oil may change color, but must not show a precipitation. Still another good oil test is the evaporation test. This is the result of slow heating, and the usual speci-

fication is that the oil shall not lose over 5 per cent. of its volume when heated to 150 degrees Fahr. for 12 hours.

Flash point, burning point and precipitation vary with the service for which the oil is intended, thus air-cooled motors always require a much higher oil test than those for water-cooled machines. As this is some indication of the quality, it is higher priced and harder to obtain, both in purity and evenness, and as a matter of convenience. Three hundred degrees is about the lowest flash point that should be accepted. With this would go 350 to 400 burning point and about 500 precipitation lower limit. In fact, oils may be had for any desired flash point and burning point up to 450. Beyond that they are hard to obtain. It is frequently claimed that this, that or the other oil will test 800 degrees, meaning the burning point. In the face of this statement, a simple home test as outlined above will prove whether or not you are getting what you are paying out your money for.

TIRE INFLATION EXPLAINED.

Editor THE AUTOMOBILE:

[1,858.]—There have appeared in your paper several letters asking about the effect of the Maxim tire inflator on the rubber of tires. In your answer to these letters you have allowed it to be inferred that explosive mixture or gasoline vapor is taken from the engine cylinders. As manufacturers of the Maxim inflator, we would like to have this wrong idea corrected. In the Maxim inflator nothing but exploded gas can get into a tire. If a moment's thought is given the question, this will be clear to anyone.

The tire must be inflated when the car is standing still. The engine, therefore, must be running idle. Now, an idle engine cannot be given its full throttle opening or it will race. If the throttle is not opened full, the compression cannot be normal. It must be very much below normal. This being the case, it cannot get out, as it cannot lift the inflator check valve. Hence, unexploded charge containing gasoline vapor cannot possibly get into the tire.

As only high pressure gas can lift the check valve, it becomes necessary to ignite the charge in the cylinder to get this pressure. But even the ignited charge of an idle engine is not high enough to get into a tire against the resistance of the tire valve and the pressure in a tire. It is, therefore, necessary to get at least some load on the engine. This is easily done by cutting out the ignition on three cylinders, leaving only the one fitted with the inflator to ignite. This gives good explosions in this cylinder, and a high enough pressure to inflate a tire. There can be no gasoline vapor in this gas. The only deleterious matter which can possibly get into the tire is oil, which may be carried over from an engine having excess cylinder lubrication. This is trapped, however, along with the moisture which is one of the products of combustion.

In inner tubes which have been inflated for over a year by this inflator, never having had anything else used on them, the rubber is distinctly better than is usually the case. All this has been proven by the Hartford Rubber Works Company, makers of Hartford tires, and many users of the inflator, after months of service.

F. A. LAW MACHINE COMPANY.
Hartford, Conn.

The point which the manufacturers have endeavored to bring out is that unless the mixture is correctly proportioned, that is, exactly right, the explosion pressure will not be the maximum and therefore will not be able to lift the check valve. In case the mixture is just right, it will be completely burned and thence no gasoline, vapor or otherwise, will enter the tire.

The effect of excess oxygen, hydrocarbons and oil will still be present.

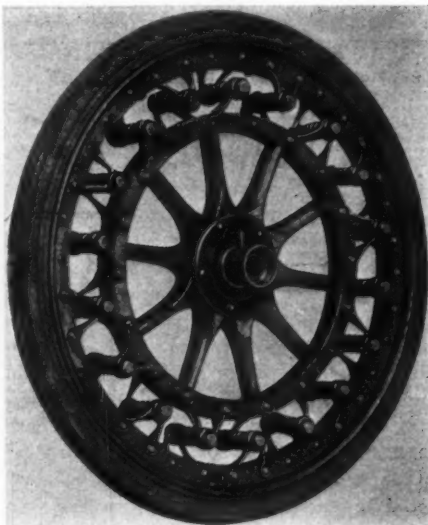
AN AMERICAN SPRING WHEEL.

Editor THE AUTOMOBILE:

[1,859.]—Being ourselves engaged in the manufacture of a spring wheel, we were very much interested in the article entitled "French Spring Wheel Appears Meritorious," in "The Automobile" of April 15.

Your account shows very clearly the manner in which this wheel works, but there are to our mind two disadvantages to this or any spring wheel dependent for its riding qualities on radial springs. The first and most important is that in a radial spring wheel, even where the springs are put in without tension, by far the greater share of the load falls on the springs immediately above and below the hub. The springs on the sides are almost useless, and unless they are fastened by a perfect ball and socket joint, so that the springs pull straight and do not bend, what little load they carry is carried at a tremendous disadvantage.

We notice in the article that two of the springs were broken. Wherever a spring is pulling out of line with its axis the likelihood of fracture is much increased. Moreover, as each spring in the radial spring wheel must in turn carry more than its share of the load, it must be made too heavy to give the proper riding qualities. In a wheel with the springs parallel with the hub, where each at all times bears only its proportional share of the load, the springs can be made light enough to give the desired riding qualities.



The Seaton Spring Wheel.

The second objection, we observe, has been recognized by the inventor, namely, the tendency to wobble or dish. He has incorporated a set of four solid braces. This, however, seems to us but a make-shift, as it is practically the same thing as depending for radial strength on four spokes in the solid wheel. With this construction, running up on curbs at an angle or turning out of car tracks would be very likely to prove disastrous.

THE AMERICAN SPRING WHEEL CO.
Cleveland.

The Seaton spring wheel is herewith shown. As the illustration reveals, the springs are coil springs, but are so used as never to be subjected to alternate tension and compression in a radial direction, as is the case with the French wheel previously mentioned.

DEFENDS WATER COOLING.

Editor THE AUTOMOBILE:

[1,860.]—In the issue of April 22, of "The Automobile," appeared a letter from the Franklin Company relative to air versus water cooling, in which some statements were made to which I wish to take exception. I have, personally, made a number of gasoline engine tests. In the most thorough and satisfactory of these, the results were such as to give a heat balance in which the percentage of heat converted into work was 20.76 per cent. for partial load, and 22.77 per cent. for full load. These results are not exceptional, as may be shown by the

following similar figures taken from a well-known authority on gas engines:

Per Cent.	Test by	Place.
20.6	Unwin	London
20.6	Fernald	New York City
20.7	Robertson	Lafayette
21.0	Robinson	England
22.8	Kennedy-Tower	London
27.7	Spangler	Philadelphia
30.0	Seraing, Belgium

The average of these with my own full load result amounts to 23.27. As resulting from no less than eight widely different, wholly independent, and careful investigators, this may fairly be taken as representing a more accurate figure than the 10-year-old one taken from Clerk.

Taking this as correct, then, the whole force of Mr. Holmes' statement, "We are safe in assuming that the water-cooled motor which we are testing would do no better," and the subsequent conclusion as to air superiority, vanishes into thin air. In fact, the whole letter, being based upon this, loses its force.

Instead of a gain in fuel economy as there-in pointed out, the tables are turned and there is a fuel loss. It is hard to discover how the gasoline consumption was figured, but on the same basis the apparent gain of 14.1 per cent. drops to a loss of 21.3 per cent.

Strictly aside from the other points, which I do not wish to speak of as being likely to provoke a prolonged discussion, the above, based upon careful and reliable experiments, should be given equal weight with the previously published statements.

CHARLES A. FULLER.
Brooklyn, N. Y.

The above letter is published complete as sent in, and as the points brought out therein are self-evident, no comment will be made.

NOT MODEL T FORD.

Editor THE AUTOMOBILE:

[1,861.]—In my letter (1688) in which I asked you in regard to getting new piston rings for my model F Ford two-cylinder car, my letter was made to read model T, which is the new model and a four-cylinder car. Mine is, I think, the 1905 type; however, I have had it fixed up and it is running nicely. As it misrepresented the Ford car and was an injustice to the makers, I think it right that I should ask you to please make the correction. This should have been done before now, but I was away from town at the time and for some time after.

Pecos, Texas. J. B. NEILL.

We have printed the letter in full above, but fail to see where there was any reflection upon the makers. Piston rings wear out on four-cylinders as well as upon twos, and when so worn require replacement, regardless of make or type.

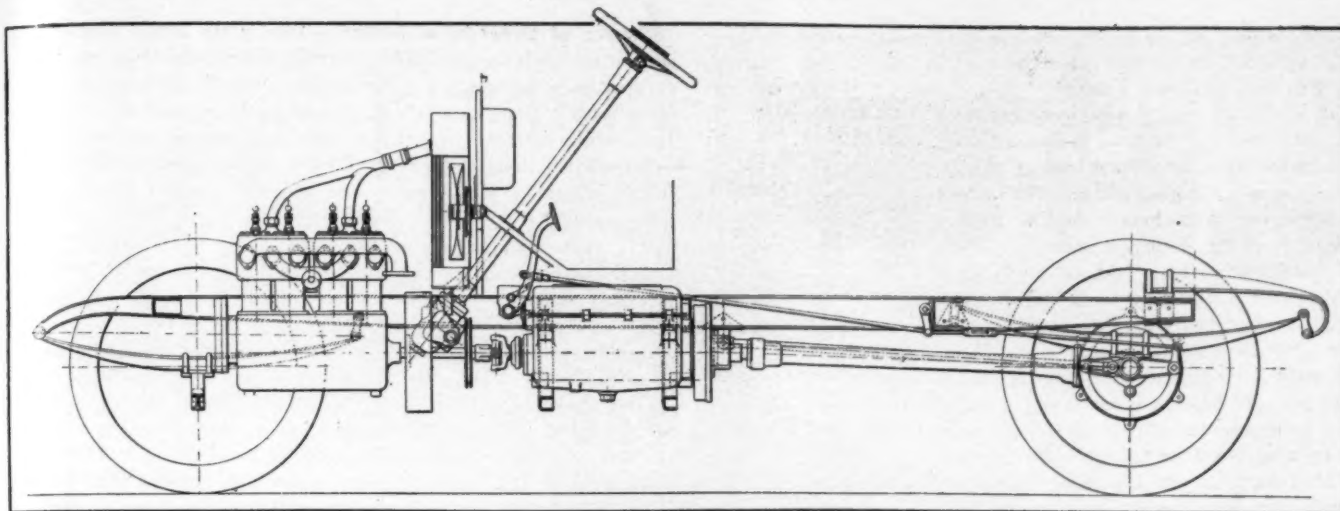
PUMP LUBRICATION.

Editor THE AUTOMOBILE:

[1,862.]—Will you please advise me what sort of lubricant to use on the water pump. Mine is of the centrifugal type.

Hoboken, N. J. A. K. LEE.

Grease is the proper lubrication for a pump, and it should be stiff enough so that the water will not wash it away. Be careful not to use too much, as highly heated water tends to carry it into the radiator and deposit it there, where it is liable to clog the circulation, or at least, reduce the efficiency of the radiator. See the article on "Automobile Cooling Systems Analyzed," March 25 issue of THE AUTOMOBILE, page 503, relative to the lubrication of pumps. It is there pointed out how a person may change the shape of the gears in a gear pump as to make it self contained as to lubrication. A somewhat similar method of procedure might be worked out for other types of pumps.



Ampere Looks Like Any Other French Car in General Appearance, Except for the Hand Levers.

ELECTRO-MAGNETS REPLACE MASTER CLUTCH ON FRENCH CAR

PARIS, April 20.—In the interests of simplicity, there have been many devices brought out, some of which did not survive the test of time and popular service. A newcomer here bears all the earmarks of being very much simplified, and, in addition, has been subjected to over two years of severe tests. Having survived this unscathed, it seems safe to any that the many unusual features incorporated in the Ampere Light Car are commendable.

The elimination of the clutch has long been a dream of automobile inventors. So, too, with the differential there have been attempts without number to simplify or dispense with that source of trouble and expense. Speed changing, the bugbear of the novice, is a continuous and never failing source of discussion. Then, when the new car is said to have no clutch, no differential, no speed change lever, and yet works satisfactorily, it is seen that the announcement is epochal, and the details of absorbing interest.

The fundamental principles of all of the sources of simple operation may be applied to any make of car, but the house of Ampere has, thus far, contented itself with a single light-weight model of 10-16 horsepower.

Engine Not Radically Different.—The construction of the motor is not unusual. The cylinders are cast in pairs, with ample water jackets, extending rather low down on the piston stroke. The latter is long, being 100 mm. (3.94 inch) for a bore of 80 mm. (3.15 inch). The valves are located on the left side of the motor and are interchangeable. The exhaust pipe is carried across the cylinders and down at the rear.

A very simple inlet pipe is, likewise, very short and leads to the carbureter, which is of special construction. The ordinary vaporizer is of the constant level type, with a float which maintains the fuel at a level, 1 mm. below the top of the spraying nozzle, this height having been proved right in practice. In the carbureter used on the Ampere, the level which gives the best results is 10 mm. below the nozzle tip. The lower level calls for a much stronger suction, and this is obtained by forcing the incoming air through the air passage at a correspondingly high pressure. At the same time

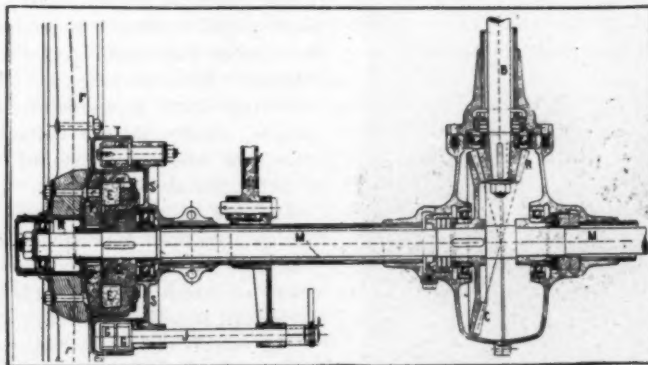
this passage is so shaped that the air current is given a rapidly whirling motion. The latter, being a necessity in this device, is further augmented by the use, at the air entrance, of a series of fan-shaped blades which deflect it. In this manner a sort of whirlpool of air is formed, causing a central depression around the spray nozzle and is strong enough to suck the gasoline up for more than the 10 mm. necessary. The air pressure being varied according to the speed of the engine, the amount of gasoline drawn into the carbureter, which is entirely dependent upon this pressure, is exactly proportioned to the speed. Therefore, no fuel is wasted and condensation is prevented. Additional air enters the mixing chamber by an opening directly opposite to the first and so located that the two air columns meet one another.

To return to the engine details, the crank case, of aluminum, is hung directly upon the main frame, which narrows at the dashboard for this purpose. The cylinders are cooled with water, circulated by a gear-driven centrifugal pump. The radiator, following the practice of Renault and C. G. V., is placed at the rear of the engine, on the front of the dash. It is of the vertical tube type, with a fan inside of it, driven by means of a belt from a pulley on the crankshaft extension.

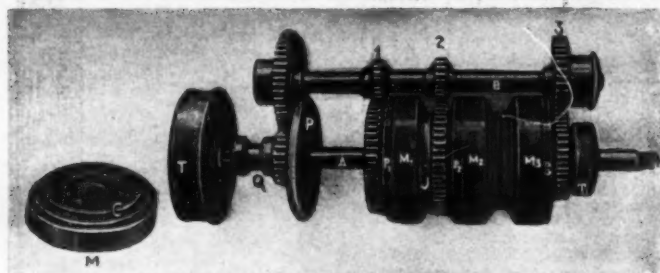
No Sign of a Master Clutch.—The first sign of the difference between this car and any other lies in the flywheel and the gearbox directly back of it. The flywheel is for balancing purposes only, and as a result is of exceedingly plain appearance. Between this and the transmission is placed a single universal joint to care for the possible difference in level of the engine and transmission, the former being on the main frame, and the latter on a dropped subframe of channel section.

The transmission is of the individual clutch type, the clutches consisting of electro-magnets.

As the small cut, displaying the parts, shows, the jackshaft is above the mainshaft. Upon the latter the gears are placed, which are clutched up to the shaft to obtain the different speeds. These are three in number, with direct drive on the high. To engage any gear a current is impressed on the windings of the magnet, which is keyed to the shaft. This attracts the plate carrying the gear, and, intimate relations having been established be-



The One-Piece Rear Axle Looms Up Large.



Transmission Parts, Showing Clutches in Place.

tween the two, just as would be the case with jaw or other clutches, the desired speed is obtained. There are four of these electro-magnets and four of the plates, that for the high speed being made integral with the gear itself.

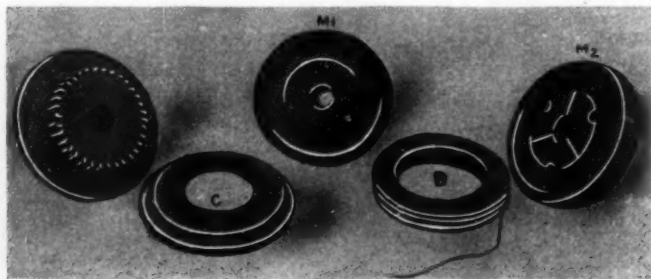
Magnetic Clutch Parts Look Very Elemental.—The other small cut shows the plates and other parts, comprising the whole of two clutches. One of these is separated and the other assembled. In the one which is taken apart, *P* is the plate, carrying the gear *E*. *M*₁ is a full view of the magnetic plate and shows the keyways, used in fastening it to the shaft. At *B* is the magnet complete, with a wire leading to the rings. On the right is the magnet set into place in *M*₁. These represent at the same time the gears themselves and their method of operation, and, with the case and bearings, complete the transmission.

Directly back of the gearbox is a brake drum and internal expanding brake. Operating here, ahead of the bevel gear reduction, the advantage in braking is increased in that ratio.

Cardan Shaft Drive Is Regular.—Seekers after variety will find none in the shaft drive, which is a good example of designing along standard lines. The driving shaft is enclosed in a stout tube and carries a universal joint at the front end only. The tube is free at the transmission end. The torsion rod is pivoted on the center line of the joint, so that its action is correct.

An inspection of the line drawing of the rear axle construction displays another excellent piece of designing. The differential will at once be missed and the resulting simplification noticed. The rear construction then simmers down to the gears themselves, their shafts and the requisite thrust and radial bearings. All of these are of the ball type, and provision is made to take thrust in both directions, an unusual feature.

One-Piece Rear Axle of Great Strength.—One outcome of the elimination of the balance gear is that it allows of the rear axle being made in a single piece, so proportioned as to have the greatest section at the point of maximum bending moment, the center. This gives great strength to the whole rear construction. On the outer ends of the rear axle are keyed a pair of magnetic clutches, one at each end. Except for the diameter, which is slightly greater, these are the same as the clutches used to operate the transmission gears. The mode of operation is the same, also. When current is turned into the magnet *E*, contained within a recess in plate *D*, the corresponding plate *P*, incorporated in the rear wheel, is attracted, and as long as the current passes and energizes the magnet, is driven by the rotating axle. As soon as the current is cut off the wheel is freed, due to road resistance and is no longer driven from the motor.



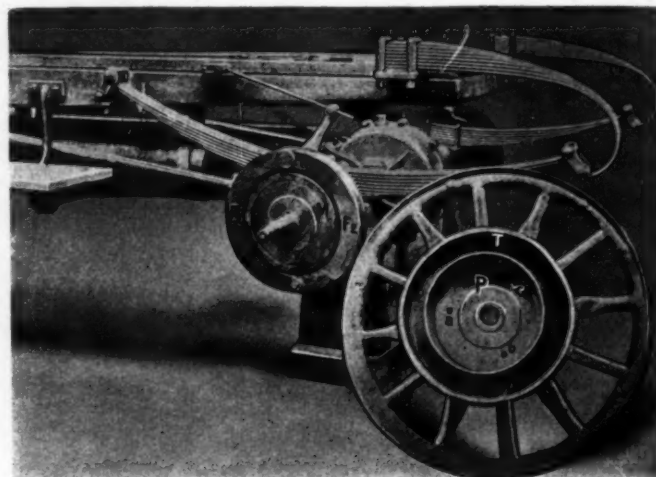
How the Magnetic Clutches Look When Dissembled.

Source of Differential Action.—This is the action which displaces the differential. The steering gear turns free up to a certain angle, at which it automatically cuts off the current to the inner wheel. The inner wheel, thus being disengaged and running free, while the outer wheel continues to drive the car, a perfect differential action is obtained. This is all done automatically by the movement of the steering wheel, and no manual work on the part of the driver is necessary.

The brake drums, wheels and other parts are standard, as is seen in the photograph, in which *M* is the magnetic clutch and *F*₁ *F*₂ the two halves of the hub brakes.

The control really displays all of the simplifications, at which the innovations are aimed. All told, it includes the steering post, on which are, besides the wheel itself, the spark and throttle levers, above both and in the most convenient place, a finger lever, which operates all speeds by a limited movement of perhaps 3-8 inch per speed. There are no hand levers and but two foot pedals. The right of these operates the brakes in the rear hubs. The other, answering to the ordinary clutch pedal, upon a slight forward movement, cuts off the current to all clutches, in which it follows the action of any other clutch. A further movement results in the application of the shaft brake. A toe pedal may be used for acceleration and is placed at the right.

Source of Electric Current Is Interesting.—The two sources of current, on the other hand, are of live interest, as on an



View of Rear Construction, with Wheel Removed.

electrically controlled car, like this one, the current furnished is the "whole thing." There are two magnetos, the ordinary one for ignition; the Nilmelior, driven from the crankshaft and located alongside the engine, opposite to the valves. For furnishing current to the magnets, another magneto is furnished. This is located upon an extension of the lower half of the gearbox, which extends from the side of the box to the main frame on the right side, forming a wide shelf.

This magneto is enclosed in a water-tight case and is belt-driven from the cardan shaft. It has been specially constructed, with special windings, to produce a current of perfect constancy, but limited amperage. At very high speeds the voltage increases slightly. This specially wound machine, it is claimed, has the advantage over accumulators for this particular work, of less weight, smaller loss of voltage, decreased danger of short circuits, and increased reliability. If desired, the cars may be had with accumulators, however.

The use of electro-magnets for speed changing is not new, having been tried by Panhard in 1898. This effort failed for the lack of a suitable source of current, but the present device, the result of much scientific research and exhaustive practical experiments, is believed to have overcome all former defects.

The disadvantages, which only years of use can bring out fully, are electrical complications, and the introduction of the magnetic clutch, not generally considered reliable.



The Friction Drive and Enclosed Chain Make a Very Simple-Looking Outfit.

PONTIAC, MICH., April 26.—Which is preferable, three or four speeds? This question is one that is agitating numbers of manufacturers and users. It does not concern the makers of the friction-driven Cartercar, the Cartercar Company, of this city, for the user of this car may have either one or a combination of both, if desired. That is, the transmission to which this company has pinned its faith has an unlimited number of speed changes, one for every occasion. At the beginning, six years ago, the concern started with the idea of a friction drive. That it has been successful is borne out by the necessity for increased factory space. The present plant at Pontiac occupies five acres of floor space, totaling 218,000 square feet.

The production will be limited to two models, both embodying all of the newer improvements and all of the distinctive Cartercar features. These will be known as Models K and H. The former is continued from last season, while the latter is an addition to the line. Model K is equipped with a five-passenger touring body, and the motive power is the same two-cylinder opposed engine as has been used. It has a 5 1-2-inch bore and a shorter stroke of 4 1-8 inch. At a normal speed of 1,000 revolutions, the power developed is in excess of 22 horsepower.

Thermo-Siphon Cooling Featured.—The natural system of water circulation is used, without a pump or fan. With this system the water circulates more rapidly as it becomes hotter, and in the case of hill climbing or otherwise when the motor is working hard and running slow, more water is moved around.

The friction transmission is of very simple construction, with very few parts. It is, therefore, easy to care for and not expensive to maintain. Upon the prolongation of the crankshaft is mounted the aluminum disc, while against this a movable friction wheel with fiber facing presses. The latter is mounted upon a jackshaft and by sliding it along the various speeds are obtained. From this shaft, the final drive is by sprocket and chain to the rear axle. The chain is enclosed in a case of aluminum, which is said to be dust and oil-tight. Within this the chain runs in a bath of oil, which lubricates it thoroughly.

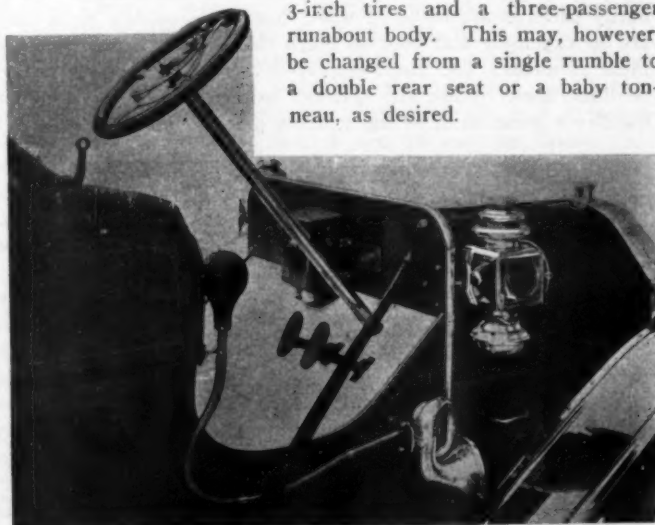
A series of experiments conducted by them with two cars running under parallel conditions for a distance of 6,000 miles resulted in a stretch of but 1-16 inch for the enclosed chain and in the shorter distance of 3,000 miles of 2 1-4 inch for the other chain, which was open and exposed.

One Speed Lever to Operate.—All of the speed changes are made by means of a single lever, located at the right of the operator in the usual position. This not only suffices for the forward speeds, but the reverse as well. In conjunction with this, the left-foot pedal moves the friction wheel into and out of engagement, like the clutch on an ordinary car.

One advantage which the makers of the car claim is that the transmission is practically fool-proof. In that it will stand endless abuse and hard driven with a minimum of repair expense, this is nearly true. The only part to wear is the fiber rim on the sliding wheel. This, it has been found, is good for 4,000 miles before replacement, which distance can be increased by careful driving. Replacement means little more than time necessary to do the work, as the fiber facing costs very little.

The wheelbase of Model K is 103 inches. The frame, which has a rise just above the rear axle for clearance, is of channel-section pressed steel, the dimensions being liberal. A dropped cross-member in front stiffens the construction there and acts as a cradle for the radiator. The other two cross stiffeners are located at the extreme rear and in the center, the latter carrying the transmission. The springs are of the now-generally accepted flat type. Both front and rears are semi-elliptic, and shackled at the rear end. The front axle is of the tubular form with large yokes and extra large steering knuckles. The cross connection is placed at the front of the axle.

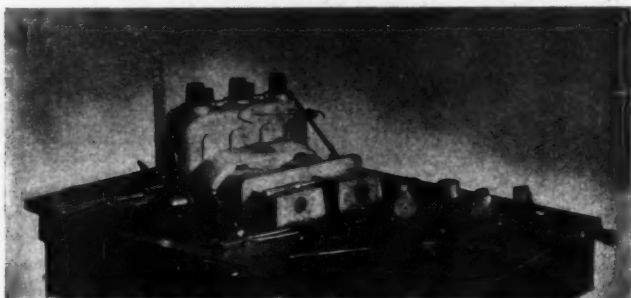
Popular-Priced Model, Too.—In addition to the larger car just described, another of the roadster class will be brought out. This is Model H and will have a four-cylinder vertical motor of 4-inch bore and equal stroke. This motor is also rated at 22 horsepower. The cylinders are cast in pairs with the valves on one side. The car has a 100-inch wheelbase, 32 by 3-inch tires and a three-passenger runabout body. This may, however, be changed from a single rumble to a double rear seat or a baby tonneau, as desired.



The Control Is Reduced to Foot Pedals and a Single Lever.

GASOLINE ENGINE CASTINGS A PROBLEM

VERY few of the owners or operators of automobiles, wrapped up as they are in their own operating troubles, stop to think of the troubles which the manufacturer has had previous to the final product. Chief among these sources of worry and friction is the matter of suitable castings, one particular branch,



Aluminum Cylinder Pattern and Tools Used in Making.

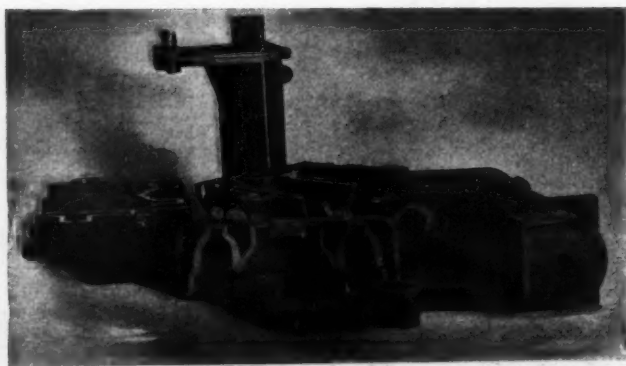
cylinders, causing as much trouble as all of the others put together, if not more.

Granting the necessity for suitable castings, it becomes necessary to produce them, and all large users are alive to the difficulties incident thereto. For instance, there is the matter of the material, usually gray cast iron; then the process has much to do with the finished product and its composition. In processes, there are two in general use: first, the ordinary cupola method, and, second, the air furnace. The former is an approximate way, as the exact composition cannot be assured, nor can the physical properties be controlled within the close range necessary for regular and even work.

In the air furnace, on the other hand, the metal does not come in contact with the fuel nor with the air, as there is no forced draft. As both of these items must exert an influence on the product, it follows that their absence makes for a superior iron.

Another item which looms up large on the trouble horizon is the matter of proper patterns and coreboxes. The first, it might be explained, makes the depression in the sand corresponding to the exterior of the desired casting. The molten iron when poured in would fill this up solid if it were not for the pieces placed therein, and these are known as cores.

In the making of both patterns and core boxes, the greatest care must be exercised to have them fit together accurately, yet so as to go together and part with ease. This makes it easy for the moulder to handle them and results in better castings. Ordinarily patterns are made of wood, but in automobile work they are so expensive and used so much that it pays better to make them of metal. The metal employed varies just as the work to be done does. Thus, the cylinder pattern, which the moulder handles a great deal, lifting it from place to place, is made of



Core Boxes Are Made of Cast Iron—A Typical Set.

aluminum to make it light. The core boxes, on the other hand, generally go to the core room and remain there. They are not handled or moved around much, so are made of a cheaper but heavier metal, cast iron.

Aside from the proper tools to work with, as exemplified by patterns and core boxes, the greatest care must be exercised in the work, and only careful workmen should be employed. The mold should be clean cut, dry, and evenly rammed. The sand should be well tempered, there should be plenty of vent area, and a lot of good judgment should be used in gating the finished mold. The cope and drag, the two parts of the molding flask, should match accurately, with cores set and vented with care. Much depends upon these conditions in securing an accurate, solid, and uniform casting. The matters of the tempering of the sand, venting, placing of the cores, gates and accurate matching of the flask parts are "up to" the molder. If cheap help is employed, and these important parts of the work slighted, the results will be such as to show the cause plainly. Tempering the sand, which means no more than mixing the proper quantity of old and new, and keeping the whole properly wetted, is directly "up to" him, and if lazy or underpaid, he will shirk it. If this is slighted the castings will show it.

The form and material of the flask also enter. Old wooden flasks cannot hold their shape and, consequently, the sand, as well as a more rigid flask, say, of iron. In the course of time



Half of Cylinder Mold, Showing Cores in Place.

nails and screws, set into the wooden sides, loosen up and allow lots of play or wobble. In matching up the cope and the drag, which must be as near exact as the foundryman ever works, this factor enters, as with the wooden form, the male and female points do not meet exactly on account of the wobble.

With iron, on the other hand, these cannot loosen, and the fit, if there is any, is exact. This sounds like a simple argument, but anyone who has ever seen the castings resulting from the former case will at once see the force of it. Half of the casting is in one plane and the other half is in another, due to the twisting which the loose pins allowed.

The matter of large prints for the main cores is one that is worthy of mention. With a small core print the long core of large diameter is able to be moved by the inflowing metal. If the mold is so gated that the iron flows to the two main cores of a casting with cylinders in pairs, from opposite directions, this will result in making the axes of the core spaces approach one another at the top. Then in machining the casting, the roughing cut will run out near the top of both cylinders, and after much work has been expended upon it the discovery is made that the casting is useless or a "waster."

The illustrations on this page which bring out clearly the points mentioned, were supplied by the Ferro Machine & Foundry Company, Cleveland.

How One Tour's New Zealand

By
Walter Grace



Alone with Nature in the Northern Island.

EVEN in far-off New Zealand, a country whose interior is little known, and is as primeval as any part of the world in these days of exploration, where roads are such in name rather than in fact, leading between towns with unpronounceable names and whose inhabitants use a language equally beyond the understanding of most white travelers, automobiling is possible, but fraught with difficulties.

Having heard a great deal about the beauty of the wildness of the northern island, the engineering feats in railroad construction visible from the so-called roads, and of the general interest in the country through which the automobilist must pass, we decided to risk a trip from Wellington to Auckland, a distance of about 500 miles, paralleling the railroad on what is known as the Main Trunk route. The country scenery became fascinating as soon as it was entered and to Marton, 100 miles, we ran through old and well-settled country over fairly good roads. At Marton we entered the first stretch of our long run of 300 miles to the North through the practically unknown King Country. The conditions of the rough and bumpy roads, the logs and stumps all around and other unmistakable signs made it evident that we were entering country that only a few years ago was virgin bush.

Above Hunterville, we got the first glimpse of the Makohine Viaduct, and soon the huge structure burst into view. It is a grand sight. We descended into the Gorge and looked up at its great height—a Leviathan built to carry trains across the great rent in the earth, dive into the tunnel and disappear out of sight. While standing there we heard the shriek of an engine, a train rushed out of one solid wall of rock, with a roar crossed the slender structure and entered another one. We climbed out of the gorge and continued through Ohingaiti and Mangaweka, mushroom townships that sprang up in a night, the even purr of the engine spelling sweet music to our ears, till presently the road became rapidly worse. We passed through Utiku, where the sounds of many sawmills—New Zealand at work—greeted us. Each of these had contributed, with heavily loaded wagons, to

The writer of this story has spent practically all his life in New Zealand, knows the country blindfold, and will be pleased to supply any of our readers contemplating a trip through that country with any information or assistance in his power. Letters should be addressed to "Antipodes," care Editor this paper.

cutting up the roads until it was nothing but a series of bumps. For a little while we were stopped by a team of working bullocks, whose ponderous movements reminded us of the middle ages. Holes, bumps and new stone for the next six miles, in to Taihape township, made the roads so bad that we took to the footpath, risking a summons rather than taking back to the road, even in the town.

Taihape seems a prosperous, business-like little town; whether it will continue so when the line is completed, with so much broken country around it, is another tale. There are several good hotels, nice-looking shops with plate-glass windows, and we had a fine lunch at the "Gretna." Here, also, we took on two cases of gasoline to see us through to the Auckland section and started off about two o'clock. The road wound round mostly a steady up-grade, with a creek or gully on one side and banks on the other, and our tires

had to grind through loose rocks. We inspected them twice, but the good old Palmers on the back wheels were standing up to the ordeal like Britons. This stretch lasted for about 11 miles, and then the road lay through open, rolling country, where we made better going, though we could tell by the heavy pull of the engine that we were steadily rising as we neared Mt. Ruapehu. When we reached Taurangarere, we joined the railroad again, and at the highest point on the line (over 2,000 feet), ran through a dusty pumice soil onto the plains and along the right of the railway line, till we struck the Waiouru Accommodation House.

After the varied and broken scenery of Mangaweka and Taihape, with the Papa cliffs of the Rangitikei River rising sheer six or seven hundred feet from the river bed, with pretty bits of bush here and there, the tussock and pumice plains we had entered were deadly monotonous, so we decided to push straight on, and, after an easy run of about eight miles all down hill, reached the Wangaehu River at a fairly wide ford. I came back on to the low speed and sent her at it. It proved to be fairly deep water, surging well over the platform and round the bonnet and the current was pretty strong, but she took it like a duck. We were soon at Kerioi, and by our gas lamps the accommodation house was soon detected. We inquired the way and found that there were two creeks unbridged still to cross between us and Ohakune, and as one was two feet deep and the other not far off that depth, we decided to stop for the night.

In the morning we had reeled off a couple of miles when we came to the first creek. The ford was narrow and deep, with a treacherous looking soft shingle bank in the shallowest part, so we took the deeper. I did not disconnect the exhaust pipe at the engine, and when in the center the exhaust pipe got below the water and the engine was smothered. It was a case then of winding her out by hand. The second creek caused us no trouble for we found but 18 inches of water. From Ohakune we made a deviation to Raetihi, where we had lunch. From Raetihi to Pipiriki, 17 miles, the going was deadly rough and we had to proceed at a crawl. The road descends about 600 feet to the latter place, on the Wanganui River, and when about six miles

away the road became better. En route we passed along the famous "dress-circle," where the road winds around the Papa cliff in a semicircle. We were the first autoists ever in Pipiriki, and the Maori people were greatly interested in the car, surrounding it and looking under it to see the "horse." We returned to Raetihi that evening with our gas lights doing good work.

On the following morning we filled up and got under way for the main trunk line again, striking it seven miles above the point we had left two days previous. A couple of miles further brought us to another great engineering feat, the Makotote Viaduct, which was just as impressive in appearance as the other high bridge, and leaving it we again entered the bush country, soon finding ourselves at the top of the spiral where the railroad runs five miles to gain one in actual progress. We stopped long enough to take a beautiful panorama of the impressive scene, with the sinking sun dyeing the hills a deep red. The

descent to Raurimu was easy, and about 15 miles further on we struck the head waters of the Wanganui River, running along it to Taumaranui, the terminus of the world-famous scenic route, "Wanganui to Auckland

via Wanganui River, the Rhine of New Zealand." It is, in fact, all that is claimed for it.

Here we learned that we could go 14 miles past Taumaranui to a section of three miles over the Poro-a-tareo tunnel, where there was only a horse track. So the car had to be hauled from Taumaranui to Te Kuiti. We spent Sunday morning overhauling the car and in the afternoon went out on the Wanganui River in a Maori canoe and enjoyed a swim. We reached Te Kuiti at 10:30 Monday morning, and in ten minutes we had shoved up a couple of planks and driven off the truck, cheered by the Maoris, who watched the unloading of the first automobile from the South. After inquiring the way, we started off to visit the Waitom caves, arriving there for lunch. In the New Raukuri cave, a huge cavern, we were led from gallery to gallery, examining the stalactites and stalagmites, taken through low-vaulted tunnels where the sound of rushing water became louder and louder until when the sound was well-nigh deafening, we realized that we were standing upon the brink of a precipice where the tunnel ended abruptly, and somewhere below us a torrent was dashing along in inky darkness. The thought of the danger and the wonder of it made us glad to turn around.

After a tramp back a mile and a half, armed with a lantern, we visited the Waitom caves, which proved a veritable fairyland, culminating in a wonderful grotto, with a pool of still but fresh water, and on looking up, we thought we had been transported into the heavens dotted with myriads of stars. Closer inspection revealed the presence of hundreds of glow worms upon the ceiling, giving forth in the darkness a beautiful, weird, soft and spectral light.

The next morning we got away for Hamilton, and after a run of about 60 miles, arrived there for lunch, finding preparations being made for a visit from the Premier, Sir Joseph

Ward, and we were able to have an interview with him in the interests of automobilists, for he is one himself, in reference to the completion of a road over the Poro-a-tareo tunnel. When this bit of road is completed, or even as it is, I can recommend the Main Trunk route from Wellington to Auckland and vice versa as being one of the finest drives in the Dominion.

The ideal round trip leaving from Auckland would be to take the car on the boat to Coromandel, then via Thames, Paeroa, Waihi, Tauranga, Rotorua, Taupo, Napier and Wairarapa over the Rimutakas to Wellington, returning via Paikakariki, Palmerston, North Marton, Hunterville, Taihape and the Main Trunk to Hamilton, and on through Ngaruawhia to Auckland and vice versa for Wellington. By this route not a single inch of the ground would be duplicated, and some of the finest scenery in the colony would be traversed, including that little known but magnificent drive of 40 miles round the seacoast from Coromandel to the Thames, on the downward trip, and on the return, the lovely trip through the Main Trunk.

In looking back over the trip, it certainly can be recommended as one of the scenic ones of the world, especially interesting to those who have never visited New Zealand, or who have visited only the coast and do not realize that the beauties of the interior are without parallel. One feature of the trip that was a surprise to me was the number of tourists met en route, all traveling in coaches, boats or railroad trains, however, for we were the first to appear in an automobile. Our independence of time

tables and of the dust and soot of the railroads, of the hot sun and dust of the coaches and the slow movement of the boats made us envied by the other less fortunate fellow-voyagers.

While wait-

ing for tea at Waiouru, the coaches from Pipiriki and Tokaanu arrived, one from the Wanganui river, 45 miles, and one from Lake Taupo. The passengers looked as if they had passed through a dust storm, and watched us start away in the cool of the evening for Ohakune. Another time we met a party, when quick action was necessary to prevent an accident. We had been running along at a good clip, when, on rounding a curve, we commenced the descent into the Sulphur Stream Gorge and came upon four coaches carrying His Majesty's mails, and all loaded with passengers doing the overland trip from Auckland to Wellington, via the Main Trunk. Down went our brakes, in went the reverse, and before the leaders had time to well realize what had startled them we had backed around the corner out of sight.

Mountains, volcanos, plains, plateaus, gorges, and, in fact, almost every kind of topography is seen in this trip. One of the most startling evidences of this was seen after leaving the Makotote Viaduct, and striking into the Waimarino plains, the road quickly changed from a good hard blue-stone to a sort of pumice twelve inches deep in dust. For ten miles, until we reached Raurimu, we re-entered the bush, the going was anything but pleasant. On the Maimarino plateau we caught a fine view of Ruapehu, Tongoriro and the active volcano, Ngarahoe.



Giving the Motor a Drink.



Maori Natives Manifested Great Interest in the Car.

LOWELL SECURES THE NATIONAL STOCK CAR ROAD RACES

LOWELL, MASS., will have the national stock car races, over the Merrimac Valley course, September 6 and 7, thus completing with the Wilkes-Barre hill climb and the Glidden tour the trio of national A. A. A. contests. With the light car event as the opener these speed tests will be the features of a week of automobile festivities planned by the Lowell Automobile Club and the people of that city. Both road races will be run under the classifications of the Manufacturers' Contest Association, and, of course, the sanction of the A. A. A., the latter organization having given the necessary permission to schedule the contests as of national interest and consequence.

At present the course over which the successful stock car competition was held last year is 10.6 miles long, but if sufficient entries are received for the coming one this can be increased to 15 miles. The plans for holding national races have all been made, and were well formulated before the A. A. A. was asked to make the meet of national importance. The entire system of roads to be utilized is such that it is in a natural amphitheater, with only two crossroads, both of which will be bridged. It is not more than half a mile from the main stretch of the route to the backstretch, and, although presenting difficulties for the drivers, it is not considered a dangerous course as circuitous courses go, and should prove very fast.

A \$5,000 trophy has been guaranteed for the stock chassis race, and it will be for annual competition as the A. A. A. stock chassis trophy. A proportionately suitable prize will be given to the winner of the light car contest. The official permission to hold the meet was given by the executive committee of the A. A. A., subject to a satisfactory arrangement being made between the Lowell club and the Contest Board. The request of the Massachusetts body was presented by its president, J. O.

Heinze, through the advisory committee of the M. C. A., and it is expected that the final agreements will be completed in a few days and official approval become a matter of fact.

Lowell's Mayor Calls Upon Citizens.

LOWELL, April 26.—The city officials and merchants of Lowell are becoming enthusiastic over automobile week in the Fall, and there is an assured prospect that sufficient money will be subscribed so that the series of automobile races and motor boat events can be carried out as proposed. Mayor George H. Brown is much interested in the plan for an automobile carnival and has issued an open letter to the citizens, asking their co-operation with the automobile club and the merchants in making the automobile week a success. His letter in part is as follows:

"The Lowell Automobile Club is planning to give this city the largest automobile carnival in the history of the country, and it is the duty of every citizen of every walk of life to realize the importance of this event, and to co-operate with the public-spirited men who are working to make it a complete success.

"While no official step has been taken on the part of the city to forward the arrangements of the carnival, I believe that the proposed week of events will be of two-fold importance to us, the advertisement which the city will receive throughout the country, and the financial benefits which will come to our business men and tradespeople; therefore I take this opportunity of calling upon the people of our city to give their moral and financial support to this project. Manufacturers are planning to have big exhibits here, and if this locality appeals to them it may be expected that they will ultimately open branch houses in Lowell.

"Of the sum of \$10,000 which must be raised by the Lowell Automobile Club to insure the carnival of its financial success at the start, approximately \$6,000 has been promised. I ask all our citizens who are interested to help swell the fund by their contributions. I trust that in every possible way our business men will co-operate with the club in this project."

INDIANAPOLIS SPEEDWAY RAPIDLY ASSUMING FORM

INDIANAPOLIS, April 26.—Progress in the construction work on the Indianapolis Motor Speedway, embodying several new features, is the subject of most general interest at present. The great race course is rapidly assuming its permanent shape, and much of the work on it has been completed.

It has been decided that asphaltum oil will be used in surfacing the track, to eliminate dust, and the five miles will necessitate the spreading of 235,000 gallons. The whole will be thoroughly worked in, rolled, levelled, and packed so that the gravel will not tear up. This is especially the case on the curves, which are 60 feet wide, and will be banked to a degree of 20 per cent. Unlimited speed may be attained upon the straightaways, and 112 miles an hour on the turns.

Should any car leave the course on a curve it will not turn turtle on the outside, dropping down to the level of the straightaway, for there will be a levelled and inclined space between the top of the curve and the boundary line for spectators, so that the driver will be able to straighten up before an accident occurs.

The immensity of the undertaking can be realized from the fact that there are five steam tractors, 300 mules, 150 scrapers, and four six-ton and three ten-ton rollers, now in use. It will require a carload of white paint to cover the four miles of outside and two and a quarter miles of inside fence. Through these there will be six entrances to the grounds, so arranged that any part of the course and the several stands for spectators may be easily reached.

There will be separate garages for each of the racing cars, and an 80-foot flag pole, the idea being that as long as a car is in a race its flag will remain hoisted, but if it drops out, the flag will be lowered. Different colors will be used. In addition

to the main grand-stand there will be 20 individual stands to hold 40 persons each. A double-decked press stand has been built, and arrangements are being made for constructing a dark room for photographers. There will be eight special fouling and judging stands, so that the contestants will be under constant surveillance. Gasoline and oil houses, and water tanks, are being built.

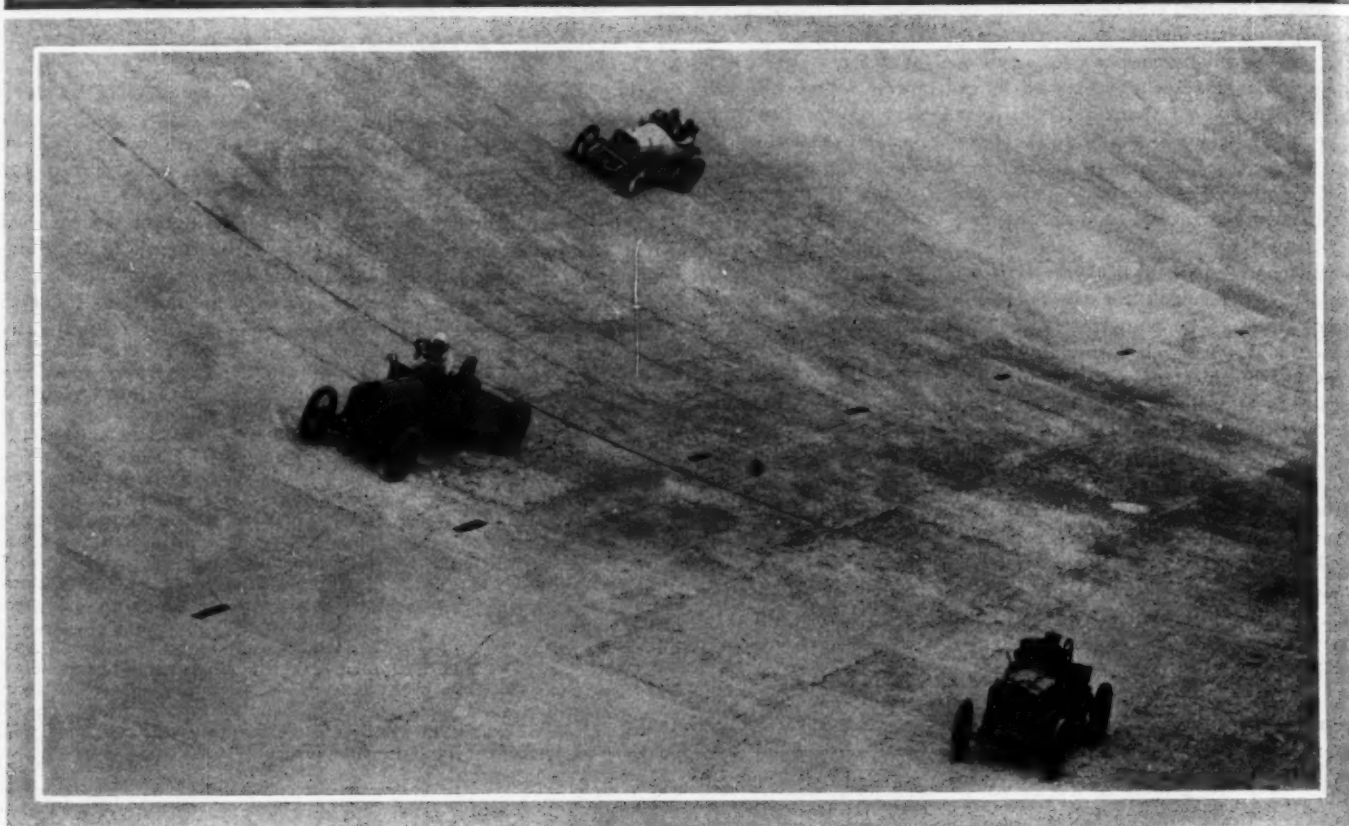
Interest in the national championship balloon race of the Aero Club of America, which will start from the speedway grounds, June 5, has grown as the result of the efforts of the Aero Club of Indiana. Within two weeks amateur balloonists from three cities will arrive to complete the number of ascensions necessary to become registered pilots. Nine entries have been received, representing clubs of St. Louis, Chicago, Indianapolis, Buffalo, Boston, and New York. The gas mains from the city to the grounds, a distance of four miles, have been laid, and everything is in readiness for trial trips.

"BLUE BOOK" PATHFINDER AGAIN BUSY.

The "Official Automobile Blue Book" pathfinding car, which last year covered over 30,000 miles, started last Tuesday from New York for Ohio and Indiana to complete the work for Section 4 of the "Blue Book," which the publishers intend to be a complete guide to the Middle West States. The car will later on be joined by Robert Bruce, editor of the "Blue Book," who has been in Chicago for some time laying out routes.

The first German school of aviation has been formed under the auspices of the Bavarian Automobile Club.

BROOKLANDS HAS NOTABLE REOPENING



Winning Mercedes Passing the Fiat and Brasler Cars at the Rate of 100 Miles Per Hour.

LONDON, April 22.—Accompanied by magnificent weather and with a large and enthusiastic audience in attendance, the Spring opening at Brooklands was held on Easter Saturday and Monday, the program being pronounced one of the most successful ever held since the track was inaugurated. The entries were good and the programs run off without hitch on both days.

Saturday had five events and an "extra," the latter being a time trial on the recently constructed test hill by an 18-horsepower Straker-Squire, the best time averaging 18 1-4 miles an hour from a standing start.

The first event, the Easter Junior handicap, for cars up to 25 horsepower, was won by an 18-horsepower Straker-Squire driven by L. R. Squire, who took the lead at the start and held it throughout the three miles of the race, his average being 59 3-4 miles an hour.

The Weybridge cup for cars of 37 horsepower or under for the same distance was won by H. G. Nalder in a 35.7-horsepower Berliet, at an average speed of 62 miles an hour.

The chief event of the day was the Senior handicap for cars of 25 horsepower and over, the distance being 5 3-4 miles. The winner was A. W. Tate, on a 59.6-horsepower Mercedes, who started from scratch and gradually overhauled the field, winning by a small margin. The average speed was 87 miles an hour. This was the only event for private competitors during the day. In addition, there were two motorcycle events at five miles, the winners being H. H. Bowen and W. H. Bashall, both riding 3 1-2-horsepower Triumph machines.

Easter Monday's program was more attractive than that of Saturday. The attendance was somewhat larger by reason of the holiday, and in spite of a strong cold wind which arose.

Showers in the morning had wet the track, and there were some exciting skids as a result, especially at the turns. Fortunately no one was injured, although a motorcyclist was thrown as a result of a seized motor.

The first event was for the Sizaire et Naudin Cup for cars of that make having a single cylinder motor of 120 mm. bore and 130 mm. stroke, the course being down the finishing straight, a distance of about a half mile. The result was a tie between W. H. Milburn and R. H. Hart, the former appearing to slow down so as to make a dead heat of the race. Later on the tie was run off and Hart won, Milburn being left at the starting line. The winner's speed was 36 1-2 miles an hour.

The Easter Senior handicap was the next event, it being for cars of 25 horsepower and over, the distance 5 3-4 miles. A. W. Tate, on a 59.6-horsepower Mercedes was the winner, although Baker White on a 60-horsepower Napier held the lead for over 5 miles, but was finally passed by both Tate, and J. W. Stocks on a 25.6-horsepower de Dion. Tate's time averaged 88 miles an hour. It was during this event that considerable skidding took place and several collisions were narrowly averted.

The Open Four-Inch race for 5 3-4 miles and for cars under the "Four-Inch" classification, was won by a de Dion, driven by W. V. Jolley, at an average speed of 68 1-2 miles an hour, the winner having about 50 yards to spare.

The final event was an obstacle race, in which the contestants had to keep within parallel lines about 25 yards apart and dodge a series of dummies, which were worked across the course, without leaving the lines. B. S. Millard on a 8.9-horsepower Sizaire won without touching a figure, his time being 34 seconds for the 100 yards of the course. The next competitor, A. R. V. Garnett on an 18.7-horsepower Straker-Squire took 32 2-5 sec.

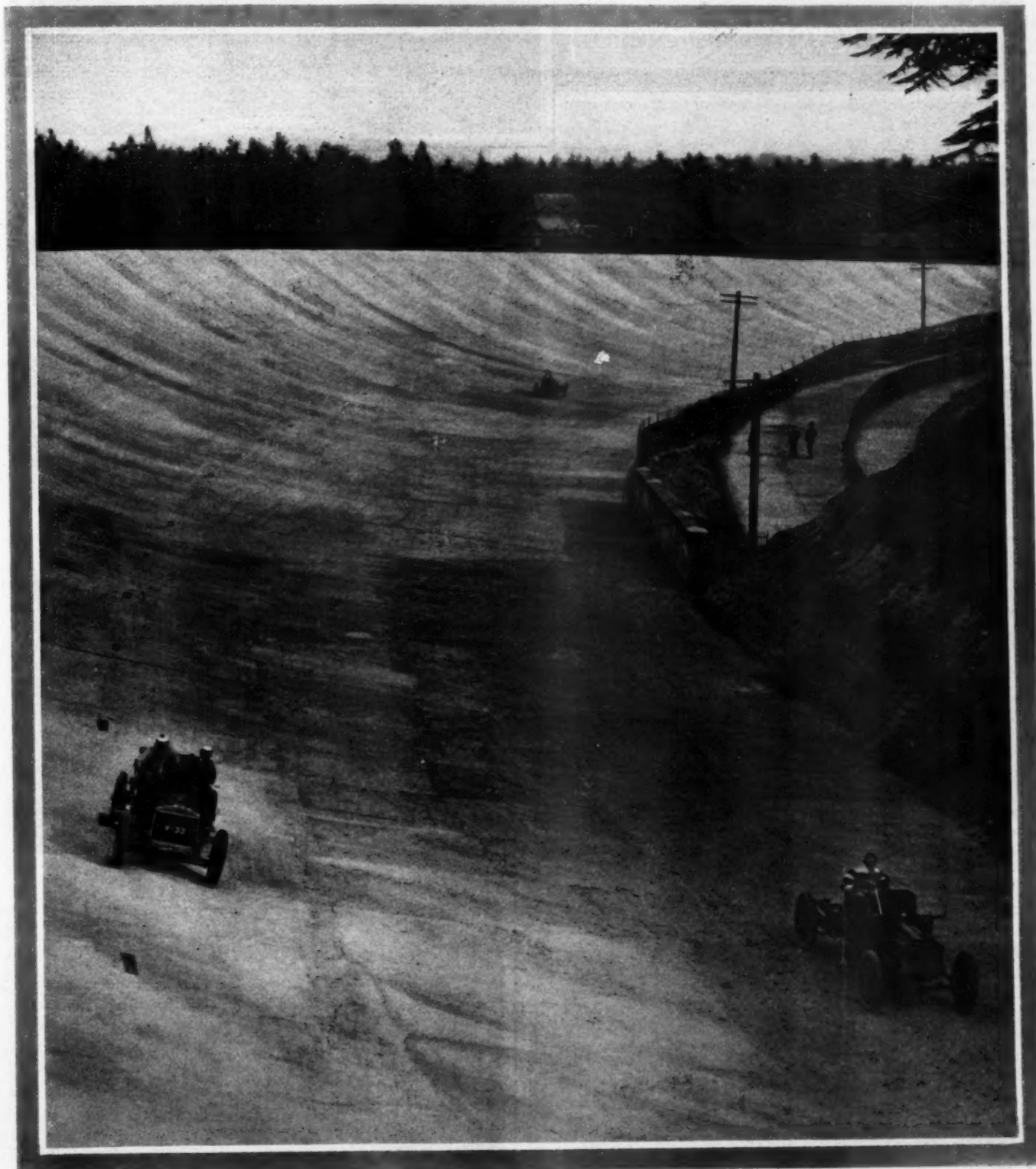
STURMEY ON THE KNIGHT ENGINE TEST.

Henry Sturmeý, one of the well-known British automobile authorities, in his comment printed in *Motor* gives expression to this opinion concerning the Knight engine:

I confess to a considerable feeling of satisfaction that the Daimler Company have at last carried out so searching an official test of the new Knight engine and with signal success, because I believe, while I was the first in this country to turn the Knight engine down by mental reckoning—which I did three years ago on seeing the drawings in an American paper—I was the first over here, I think, to accept it as a practical design (after seeing and trying it and hearing Mr. Knight's explanation on points I raised). I am saying nothing in this paragraph as to whether it is better, or more

efficient, or more silent than the usual type of engine, but what I am saying is that the test has shown that those who have refused to accept the unofficial evidence presented to them and who have stated, with more or less vehemence, that the sleeves could not be lubricated; that there would be excessive wear, and that, for all practical commercial purposes, it "could not work," have been shown to be wrong.

Mr. Sturmeý's opinion is that of a majority of British automobile authorities who were also skeptical concerning the Knight engine, and held similar views regarding the wear and lubrication. The results of the bench and 2,000 miles test at Brooklands have demonstrated to all that the engine is a commercial success and not an experiment.



Three Cars Taking the Expansive Bend in the Easter Handicap at Brooklands Track.

West will supply
A.A.A. Tour
with
Varied Roads



1. Leaving Watertown, Wis.
2. A Stop at Port Sheridan.
3. Just coming through a mud.
4. A car ready for an automobile.
5. Near Watertown, Wis.
6. A car ready for an automobile.
7. A car ready for an automobile.
8. A car ready for an automobile.



ROADS WILL BE BETTER FOR A. A. A. TOUR.

While the first three days of the A. A. A. tour, from Detroit to Madison, Wis., the travel through an unpicturesque country, the scenery becomes fine after leaving Madison. In some respects, according to "Pathfinder" Lewis, it surpasses the scenery enjoyed on the Eastern tours. The pathfinding trip this year was begun two weeks earlier than usual, and the dirt roads that will be excellent in Summer are now long stretches of mire. Lewis says he has had more severe experiences than ever before, but that the route he is laying out will afford a more enjoyable contest and a better one in a sporting sense than in previous years. At times the roads have seemed impracticable, but he is sticking to it, and having a light car with 30 horsepower (an E-M-F.), he has not been stalled, but has progressed steadily, though slowly.

It has been the object of the A. A. A. Contest Board to make the tour this year of greater interest to the automobile users in general by making it of more value as an object lesson. This is to be done, not by making the contest more difficult, but by having the rules more exacting. The performances of the cars will be set forth with fuller detail, because of the improved rules, and motorists everywhere will get a better line on the possibilities of touring on schedule. There will be fractional points of penalization incurred for things not before penalized, and while the contest is certain to be close, it is expected in this way to evolve an individual winner for each trophy, without any car being discredited because of minor adjustments that are ordinarily experienced by everyone.

The interest being manifested by manufacturers indicates that the entries this year will outnumber those of last year. Already a number of paid up entries are in hand, something which never before has been the case so far in advance of the tour. The entries this year close June 15, with \$100 deducted from the fee of those who enter before May 15.

INDIANA REPRESENTATIVES IN A. A. A. TOUR.

INDIANAPOLIS, IND., April 5.—This State will have its usual quota in the annual tour for the Glidden Trophy during the coming summer, with perhaps additions to the number which have competed in the past. Webb Jay has announced his intention of driving a Premier, the first time that he has ever been at the wheel of a gasoline car in a big contest, and the first time he has been on the tour since 1906. George A. Weidely will be at the wheel of another Premier, and probably Ray MacNamara will handle the third.

It is understood that the Haynes will have its two representatives, with Frank Nutt in charge of one and Loring Wagoner, the other. At least one Marmon will be on hand under the guidance of Frank E. Wing, of Boston, who made perfect scores in both the 1906 and 1908 tours. Just what the Overland and National factories will do is not known, but it is thought that they will have cars in the run; the National may have a full team and the Overland both touring cars and runabouts. The Apperson has not been seen in tours for two years, but as it has been in numerous contests lately, especially hill climbs, there is a rumor that it will also be in the annual trek.

MARYLAND CLUB TO HAVE SEALED BONNET.

BALTIMORE, April 27.—A sealed bonnet endurance contest will be held May 15, under the auspices of the Automobile Club of Maryland, the route selected being from Baltimore to Frederick, then to Gettysburg, and back to this city. The cars will be placed in a garage upon return to Baltimore, and a committee of experts will make an examination. The slightest defect will entail a penalty. The cars will be divided into four classes: Touring cars up to 30-horsepower; touring cars above 30-horsepower; roadsters, and tourabouts under 30-horsepower, and roadsters and tourabouts above 30-horsepower. The running schedule calls for a finish within seven or eight hours.

REEVES VISITS INDIANAPOLIS SPEEDWAY.

That the completing of the new two-and-one-half-mile automobile track at Indianapolis marks an epoch in motoring, is the statement made by Alfred Reeves, general manager of the American Motor Car Manufacturers' Association, who recently visited the new speedway. The visit was made at the invitation of the officers of the new Motor Speedway, which includes Carl G. Fisher, A. C. Newby, F. H. Wheeler, and J. A. Allison. In the party were H. O. Smith (Premier Motor Mfg. Company), Benjamin Briscoe (Maxwell-Briscoe Motor Company), S. H. Mora (Mora Motor Car Company), R. E. Olds (Reo Motor Car Company) and W. H. Van der Voort (Moline Automobile Company), all members of the American Motor Car Manufacturers' Association. The visitors are enthusiastic supporters of the new plan which, they state, will result in the Middle West having the fastest course in the world, for the new track will permit of a speed of 100 miles an hour just as long as a car can stand it.

"One cannot appreciate the importance of the undertaking unless they have paid a visit to the new oval," said Mr. Reeves, Monday. "An army of more than 400 men living in camps on the grounds are literally 'making the dirt fly.' The contractors must finish their work by June 25, and the first race will be held July 15. The new course is beautifully laid out and will supply an ideal enclosure for aeronautical and motor sports. The piece of ground is more than one mile long and little over one-half mile wide, the entire undertaking involving an expense of a little more than \$300,000."

THOMAS PATHFINDER REACHES IDAHO.

Automobiling touring in the Spring in Wyoming is particularly strenuous work, according to the reports sent East by the party which is mapping out the route for the New York to Seattle endurance contest. For sixteen days the Thomas car has been battling with snow, mud, and water in crossing the State of Wyoming, with short runs, at the start in Colorado, and now in Idaho where the roads are slightly better. On Wednesday of last week the car was dug out from a mudhole near Bitter Creek by a railroad section gang of fifteen men and then placed on a corduroy road specially built for it. Thursday was spent in making a snail-like progress, and Green River was reached Friday afternoon, after having spent five days in the 130 miles separating it from Rawlins.

Better progress was made Saturday, 88 miles being covered to Kemmerer, although a number of washouts had to be filled, and the crew felt that perhaps there was really hope of their reaching Seattle. Sunday evening no report was received of the whereabouts of the big car, but Monday evening it pulled into Montpelier, Idaho. Sunday night was spent with a camp of sheepherders out on the plains, with the temperature at zero. Pocatello was reached Tuesday. The roads did not improve as much as the crew had expected, on account of more snow, but with pilots, the party is getting slowly along.

The Manufacturers' Contest Association, by a mail vote, decided not to reopen the matter of the contest.

DETROIT GAINS MORE PLANTS.

DETROIT, April 26.—Another is to be added to the long string of automobile plants located here. A company is being organized to enter the light car, low priced field, and it is expected that the new model, which for the present will be an assembled car, will be placed on the market by June 15.

Recognizing the advantageous position Detroit occupies for makers of parts, the Buffalo Carburetor Company will locate in Detroit, the plant at Buffalo being dismantled and the machinery shipped here as rapidly as possible. A temporary location has been secured, pending the erection of a plant, and operations will be commenced with about one hundred hands. William F. White, president, and Robert A. Huessler, treasurer, will also make Detroit their home.

THE AUTOMOBILE

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H. M. SWETLAND, President

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THE TRAIL OF THE ROAD-HOG.

Connecticut has one of the best systems of public roads in this country. Connecticut was the first State to abolish the arbitrary speed limit and adopt an automobile law based on equity and common sense. And although a very large part of the automobile travel on Connecticut's roads is by non-residents, these are nevertheless granted complete reciprocity. In every way Connecticut has endeavored to treat automobilists fairly, even liberally. What has been her reward may be best understood from the circular letter herewith, signed by the selectmen of the town of Berlin, which sees many passing autoists.

The selectmen of Berlin seem to be of a reasonable and peace-loving mind; there is no bombast, no hysterics, no suggestion of shot-guns or dynamite. Their letter is an appeal for justice, and it should be granted.

Unfortunately the comparatively few automobilists who are the cause of this complaint are not likely to be moved by any such consideration. It is Connecticut's misfortune, like New Jersey, to lie on the main route between two great cities. Much of the automobile travel on her roads is by through-trippers, whose only concern is to lose as little time as possible on the way. This class is the most dangerous, as it is largely made up of more or less reckless chauffeurs driving high-powered cars; and it is also the least amenable to reason. The local automobilist, who is acquainted with his neighbors

for many miles around, must behave circumspectly in order to retain their friendship. The leisurely tourist—may his numbers increase!—wishes to see the country and make the most of a health-giving pastime. It is for the most part "through-trippers" and "record fiends" that make up the tribe of the "road-hog."

These considerations may soothe our self-respect, but they do not help Connecticut. The law-abiding class of automobilists must take this matter into their own hands; it may soon be a case of self-preservation. There is too much fellow feeling among automobilists; most of them seem to have the schoolboy spirit of protecting a comrade who has broken a rule. Every right-minded and conscientious driver should make it a point to report "road-hogs," and to see that his club takes vigorous action.

W. H. Gibney, Chairman,
N. W. Baldwin,
E. W. Dyer.

Meetings
1st Day of Each Month.

Selectmen's Office Town of Berlin

Berlin, Conn., April 12, 1909.

Dear Sir:—

The taxpayers of the Town of Berlin in the last few years have expended large amounts of money to improve our highways. We desire that the entire public shall have the benefit of these improved highways. Some automobilists, however, are using these highways at a speed which transgresses the law and jeopardizes the life and property of our citizens. We believe the majority of automobilists appreciate good roads and are desirous of observing the law relating to speed. We do not wish to take active measures against automobilists, but unless they use more discretion and cease to travel at the high rate of speed on the roads of the Town of Berlin we shall enforce the State law and do it rigidly.

We have no desire to antagonize automobilists, but rather desire to work with them, but unless they show a disposition to co-operate and cease to abuse their privileges, we shall rigidly enforce the law.

Yours very truly,

(Signed) W. H. GIBNEY, } Selectmen,
N. W. BALDWIN, } Town of
E. G. ROCHE, } Berlin, Conn.

The man who ordinarily will not show consideration for others becomes even worse when placed at the wheel of a high-powered automobile. Secure himself, from harm, he cares little for those who may cross his path, and at times his conduct is such as to cause one to doubt if he is not bereft of his senses. Read on another page of the attitude of one across-the-State traveler who was remonstrated with by an observing and conscientious member of the Hartford club. Through the State, this trampler upon the rights of others was going, and little he cared for the law or those who were trying to preserve it. Small wonder is it that the citizens of Berlin and other Connecticut towns feel compelled to express themselves in terms that are unmistakable and justified. The law-abiding autoists must purge their own ranks.

Those who will not see simply because they won't, must be made to see. This reckoning has been delayed beyond the limits of the patience of the general public, which has yet to become thoroughly accustomed to the presence of the motor-driven vehicle.

HOW CONNECTICUT'S LAW IS ABUSED.

HARTFORD, CONN., April 26.—Many complaints have been made of late that out-of-State autoists touring through Connecticut have no regard for the law. A case in point is that of the reckless operation of a car bearing the New York State license number 60,967. An officer of the Automobile Club of Hartford, which organization is doing its utmost to preserve the present liberal law or bring about the enactment of a similar measure at least as good, noted the number of the car, which speeded down one of the main thoroughfares of the town and later encountered the driver at a local garage. He remonstrated with the driver, who laughed at him and stated that as he would soon be out of the State, the Connecticut law had no terrors for him. It is just such indiscreet action as this that is bound to put a crimp in the Connecticut law. It is needless to say that a close watch has been kept in general since the Legislature convened.

WISCONSIN MAY ELIMINATE SPEED LIMITS.

MILWAUKEE, WIS., April 26.—Officials of the Milwaukee Automobile Club and Wisconsin State A. A. are confident that the bill now before the Legislature, practically eliminating the speed limits for cars and making recklessness cause for arrest at any time and place, will be passed. The committee considering the measure has decided to report it favorably, after James T. Drought, counsel for the Milwaukee Automobile Club, made a vigorous argument in its favor and explained it clearly. The law makes the speed limit 25 miles an hour, but is so framed that a driver would be liable to arrest for violation if he ran recklessly in any part of the State. If a driver ran even as low as five miles an hour on a crowded street and that speed was dangerous, the driver would be liable to arrest. The bill enhances the police powers of the State while removing many harsh restrictions from owners of cars. It is an entirely new measure.

MOTOR FEDERATION NOW HAS 25 CLUBS.

WILKES-BARRE, PA., April 26.—The fourth annual meeting of the Pennsylvania Motor Federation was held at Wilkes-Barre, April 23, where the directors were the guests of the local club. Reports of the officers and chairmen of the legislative and good roads committee were decidedly encouraging, and general satisfaction was expressed over the passage through the Legislature of the Townsend motor vehicle law, which was the bill prepared by the Federation.

The board passed a strong resolution recommending that its clubs co-operate with the local authorities to secure a strict observance of the terms of the new law, and recommended that habitually reckless drivers who cannot be controlled be not only publicly expelled, should they be members of automobile clubs, but that the club officials aid in securing convictions which would entail a jail sentence or the revocation of license or registration.

The secretary's report showed an enrollment of 25 clubs, with a total membership of 2,600, an increase of 10 clubs and 800 members within the year.

The Cumberland Valley Automobile Club, the Beaver Valley Motor Club, the Juniata Valley Motor Club, the Chambersburg Motor Club, and the DuBois Automobile Club were elected to membership.

The good roads committee have plenty of work cut out for them in the preparation of a system of main State highways and the codification of the road and bridge laws of the State, to be used in the preparation of legislation to be presented in 1911.

Robert P. Hooper, of Philadelphia, was re-elected president; Peter A. Meixell, of Wilkes-Barre, and John A. Wilson, of Franklin, vice-presidents, and Paul C. Wolff, of Pittsburg, was again asked to serve as secretary and treasurer.

Joseph H. Weeks was re-appointed chairman of the good roads committee, S. Boyer Davis of the legislative committee, and L. P. Baekey of the publicity committee. The appointment of a chairman of the touring committee was withheld for the present.

A. A. A. HAS TWENTY-NINE STATE BODIES.

NEW YORK, April 26.—There are now twenty-nine affiliated State organizations in the American Automobile Association, through the election of Utah and Iowa bodies at the meeting of the executive committee, held at national headquarters, April 21. Besides the Utah Automobile Club and the Iowa State Automobile Association, the Adams County Motor Club, of Natchez, Miss., and the Montgomery Automobile Association, of Montgomery, Ala., were elected as unfederated clubs. In Mississippi and Alabama, plans have been started for State bodies.

The place and the date of the second annual good roads and legislative convention will be announced shortly, according to Chairman George C. Diehl, who has this matter in charge.

Those who attended the meeting of the executive committee were: President Lewis R. Speare, Boston, who presided; W. C. Crosby, president, and H. A. Bonnell, secretary, Associated Automobile Clubs of New Jersey; Robert P. Hooper, president, and Paul C. Wolff, secretary, Pennsylvania Motor Federation; J. P. Coghlin, president, Worcester Automobile Club; G. H. Gillette, secretary, Connecticut State Automobile Association; L. J. Powers, Jr., Springfield Automobile Club; Alfred Reeves, general manager, A. M. C. M. A.; E. P. Chalfant, general manager, A. L. A. M.; Charles Thaddeus Terry, New York; F. H. Elliott, secretary, A. A. A.

CLEVELAND AFTER A. A. A. CONVENTION.

CLEVELAND, April 28.—The Cleveland Automobile Club, supported by the Cleveland Chamber of Commerce, is going after the next annual convention of the American Automobile Association, according to an announcement made by Secretary C. J. Forbes, Jr., of the local Automobile Club.

President W. F. Bonnel, of the Cleveland Automobile Club, and Harry L. Vail, president of the Ohio State Automobile Association, expect to leave for New York City this week, in an effort to bring the matter to head. They will urge the desirability of Cleveland as a meeting place for the A. A. A. The local club has the enthusiastic support of the Cleveland Chamber of Commerce, the leading organization of this city.

CUT-OUT NOT A SIGNAL DEVICE.

MILWAUKEE, April 26.—The municipal court at Racine, Wis., has decided that the "cut-out" is not a signal device in the meaning of the law, and Roy Easson, a tester for the Mitchell Motor Car Company, of Racine, was fined \$10 and costs. An appeal has been made to the Supreme Court. George Peterson, chairman of the town of Mt. Pleasant, swore out warrants for the arrest of Easson and two others of the nine Mitchell testers, claiming that as they had no bell or horn they were guilty of violating the law requiring signal devices. Each machine, however, was supplied with a pedal cut-out, which constituted the defense.

In Milwaukee there are hundreds of machines whose only signal device is the cut-out, and the only threatened prosecution in this connection has been by a nervous man who thought the cut-out made unnecessarily loud noises. Many Ramblers are supplied with nothing in the way of signal devices except the pedal cut-out, and the testers of the Kenosha product have experienced no trouble.

NEW YORK'S PROPOSED LAW PROBABLY DEAD.

ALBANY, N. Y., April 28.—The Allds bill, to provide a motor vehicle law without a speed limit, to-day was amended in the Assembly so as to put in a speed limit and permit local regulations, in addition to a clause to shut out automobilists from States where New Yorkers are not allowed reciprocal courtesies. There was a rising vote of 71 to 48, and New York City members joined those from rural counties in voting for the amendments which kill the bill unless the Governor sends in an urgency message for passage as amended during the next two days.

SUGGESTED RULES TO GOVERN OBSERVERS IN CONTESTS

FEW of the endurance contests scheduled for the coming season are run without the use of the observer system, whereby each entrant nominates some one to ride on a competitor's car. Frequently it has been found in the past that the observers did not understand the conditions, and inasmuch as their principals were only indirectly affected by laxity, did not do the full duty expected of them. To overcome this, E. C. Johnson, of the Keystone Motor Car Company, of Philadelphia, formerly a chairman of the contest committee of the Quaker City Motor Club, and an official in many races and road contests, has compiled a set of rules in which special attention is paid to the observer question. The regulations were planned to be used in connection with endurance runs of the Q. C. M. C., and provide for the whole affair, only that section applying to the entrants' representatives on other cars being considered here.

In regard to observers, the rules say: "The committee will hold each entrant responsible for the action of the observer named by him"; and in the list of penalties, under the section on observers, the following are the regulations:

Each contestant shall nominate a responsible man to act as an observer. This man will be placed in one of the contesting cars, and it shall be his duty to keep accurate record of all replacements, adjustments, motor stops, etc., on a card furnished each

day, this card to be turned over to the chairman of the contest committee at the termination of each day's run. Contestant nominating such observers will be held responsible for the proper performance of his duty, and will be penalized as follows, should he fail in said performance:

- (a) 10 points for failure to record the actual time of passing each checking station, and at the night control.
- (b) 10 points for failure to record all adjustments.
- (c) 5 points for failure to record all replenishments.
- (d) 20 points for failure to record all motor stops.
- (e) 50 points for failure to deliver observer's card to a member of the contest committee within thirty minutes after checking in at the night control, or at the termination of the run.
- (f) 100 points for failure to record any assistance received during the progress of the run.
- (g) 1000 points for deserting the car before the completion of the run.
- (h) The refusal of an observer to make an affidavit as to the correctness of his report, should such be desired by the contest committee, will be sufficient grounds for disqualifying the entrant nominating such observer.

Some of these penalties are very severe, but it must be remembered that if the observer fails in any of these particulars the car in which he rides may be heavily penalized by something over which its crew has no control, and that it is just to inflict the penalty upon the nominee of such an individual.

FIRST ENTRY FOR GERMANY'S BIG TOUR IS DISAPPOINTING

BERLIN, April 22.—First entries for the Prince Henry tour have closed, with the somewhat disappointing result of 111, against 145 of last year's first entry. It was believed that Austro-Hungary's active participation would have brought a great number of competitors together; at present, however, only eight have entered. The three credit points for the less experienced drivers have not kept any of Germany's big guns away, and Poege, Erle, Held, Opel, Lindpaintner, Stoess, Benz, Mathis and Bugath will all come up to the mark.

Germany is naturally very much to the front with 80 entries, 16 of which are Opels, while Mercedes and Benz are down with nine cars each, and the other firms in equal proportions.

Belgium and Italy have entered nine cars, Austria eight and

France five, while England, Holland, Switzerland and the United States are completely lacking.

It is also unlikely that the severe regulations to keep freaks and specials out of the event will be of much avail, as some of the stroke measurements afford very remarkable reading. Horch has built an engine with a stroke of 170 millimeters to a bore of 85 mm. The Gaggenau cars are described as having a bore of 100 and stroke of 200 mm. One of the smallest Opel cars has a bore of 70 and a 125 mm. stroke. Poege's Mercedes is fitted with a 90 by 140 mm. motor. It will be interesting to see what the regulation touring cars will be able to do against these special designs. Among all the first 111 contestants there are only two six-cylinders, these being the Protos cars.

ACCESSORY ASSOCIATION NOW HAS NEW YORK QUARTERS

NEW YORK, April 26.—Representing 180 manufacturers of automobile parts and supplies, the Motor and Accessory Manufacturers now have headquarters in New York City, accessible to members who come to the metropolis, and comfortably located at 17 West Forty-second street. This organization is composed of makers who furnish automobile factories, dealers and garages with nearly all of their supplies, and is chiefly occupied in acting as a clearing house for information, introducing new concerns, and in deciding policies of national importance.

The manner of participating in the annual shows, and of not going into the local ones on account of the great number and consequent expense, is a matter considered by the accessory manufacturers through the association. Membership gives numerous advantages: prestige of being associated with prominent firms and men in the industry; protection against a wave of price cutting, although it does not attempt to control or even to fix prices, as this would be in defiance of the interstate commerce laws; and the advantages of a clearing house of experienced tradesmen. This last is an important feature of the work of the central office, for on its lists are the names of over 3,000 purchasers of automobile supplies, and all are garages, dealers

or factories, none being individual buyers. The members of the association give information regarding their customers, but the name of the member filling out the blanks is not noted. Other members may at any time write to the office in this city asking for the credit of rating of prospective purchasers, and thereby know just how to treat matters of credit.

The organization is growing rapidly, an average of five new firms being elected at each quarterly meeting. The officers are:

President, H. E. Raymond, B. F. Goodrich Company; first vice-president, H. T. Dunn, Fisk Rubber Company; second vice-president, F. E. Castle, Atwood-Castle Company; third vice-president, C. E. Whitney, Whitney Manufacturing Company; treasurer, W. S. Gorton, Standard Welding Company; secretary, P. S. Steenstrup, Hyatt Roller Bearing Company. The directors are: H. S. White, National Tube Company; D. J. Post, Veeder Manufacturing Company; C. T. Byrne, Byrne, Kingston & Company; H. W. Chapin, Brown-Lipe Gear Company; E. S. Fretz, Light Manufacturing & Foundry Company; L. M. Wainwright, Diamond Chain & Manufacturing Company.

The New York office is in charge of H. M. Street, from whom information regarding membership can be obtained.

What the Clubs are Doing These Days

HARVARD TROPHY AT BAY STATE MEET.

BOSTON, April 26.—The complete list of events for the June 17 race meeting of the Bay State Automobile Association at Readville track has been announced by the contest committee, of which Chester I. Campbell is chairman. There will be eight events, the most important of which is that for the Harvard trophy, offered by students of Harvard College for a 25-mile event open to all cars. In addition to the trophy the winner will receive \$500 in cash, while cash prizes of \$200 and \$100 are offered for second and third. It is expected that a number of fast cars owned by students will compete in this event. Another trophy race is that for the Automobile Trade trophy. This is to be at 10 miles for cars over 36 horsepower, close coupled and baby tonneau bodies being excluded. The third trophy event is that for the Bailey trophy at five miles for stock cars to be driven by owners. The complete list of events is as follows:

- 1—Five miles, for Bailey trophy, open to stock cars to be driven by owners or their representatives not having any connection directly or indirectly with the automobile trade, no chauffeur or professional driver.
- 2—Twenty-five miles, for Harvard trophy, open to all cars. First prize, the trophy and \$500 additional; second prize, \$200; third, \$100.
- 3—Five miles, open to touring cars up to and including 24 horsepower, close coupled and baby tonneau cars excluded. First prize, cup; second, gold Bay State Association medal; third, gold Bay State Association medal.
- 4—Five miles, open to touring cars up to and including 36 horsepower, close coupled and baby tonneau cars excluded. First prize, cup; second, silver plate; third, bronze plaque.
- 5—Ten miles, for Automobile Trade trophy, open to cars over 36 horsepower, close coupled and baby tonneau cars excluded. First prize, trophy; second, silver plate; third, bronze clock.
- 6—Three miles, open to stock car, roadsters or runabouts up to 30 horsepower. First prize, cup; second, silver plate; third, Bay State Association medal.
- 7—Five miles, open to stock cars, roadsters or runabouts, 31 horsepower and over. First prize, cup; second, gold Bay State Association medal; third, gold Bay State Association medal.
- 8—Special match race, to be announced later.

The contest committee is composed of Chester I. Campbell, secretary of the Dealers' Association, chairman; F. E. Wing, the Marmon agent; C. J. Bailey, the Bailey tire tread manufacturer; Walter G. Schmunk, of the White company, and James Fortescue, secretary of the Bay State Association. The track has been secured and will be put in first-class condition.

In addition to the races the association is planning several other events, including a club run to Providence on Memorial Day, a hill climbing contest on the Fourth of July, and an endurance run to be held later in the season.

COLUMBUS AFTER A GREATER MEMBERSHIP.

COLUMBUS, O., April 26.—The Columbus Automobile Association will start an active campaign for membership May 1, which is the beginning of the fiscal year.

The Supreme Court of Ohio has granted leave to T. M. Drolesworth, of Summit county, to file a test suit against the State automobile law. The complainant was fined for violating the law. He contends that the law is unconstitutional because it prescribes unequal fees and gives the State a monopoly of the business of furnishing tags. Automobile owners do not believe that the suit will succeed in overthrowing the law.

LARGE ADDITION TO LONG ISLAND CLUB.

BROOKLYN, N. Y., April 28.—In the new house of the Long Island Automobile Club the regular monthly meeting this evening resulted in the election of one of the largest membership lists ever proposed in the history of the organization. Fifty-four additions were made, 49 of these being to resident membership, while the remaining five were non-residents. The opening of the club garage, with its accompanying club-room facilities, has been a great success.

MORE CLUBS FOR A. C. C. OF NEW JERSEY.

NEWARK, N. J., April 26.—Organization of more county clubs and the strengthening of those already formed is taking much of the time of the officials of the Associated Automobile Clubs of New Jersey. Last week Frederick H. Elliott, secretary of the American Automobile Association, and Horace A. Bonnell, secretary of the New Jersey Federation, went to Plainfield to reorganize the club established there and place it on a firmer footing. There are a large number of automobile owners in the vicinity of Plainfield, and the local club promises to form the nucleus of one of the strongest bodies in the State.

The Warren County Automobile Club, with eighty members, has applied to Secretary Bonnell for the conditions of membership in the Associated Clubs, and will probably join the State organization within a month. This will strengthen the State body, as there has been no representation in that part of New Jersey covered by the Warren County Club.

SYRACUSE CLUB WILL POST SIGNS.

SYRACUSE, N. Y., April 26.—Secretary Forman Wilkinson states that the Syracuse Automobile Club will carry on a vigorous sign placing crusade this Summer, a stock of 100 signs having been ordered, in co-operation with town boards or village officials throughout this section of the country. The signs will be at the call of the townships, and the club will welcome the assistance of autoists in ascertaining needed location for these direction guides. The agitation against joy riding is supported locally, for there has been some prevalent, and the club has resolved to use its influence to have this practice stopped and a stricter adherence to the speed laws observed.

Permanent club offices will be opened on May 1 in room 606, S. & A. K. building, where accurate information regarding routes will be kept for the use of tourists.

CENTURY AUTOMOBILE CLUB TO BE LIVE WIRE.

PHILADELPHIA, April 26.—The Century Automobile Club, the successor of the Century Wheelmen, is preparing to enter actively into the competitive game. As a first step toward this end a live committee on contests, tours and entertainments has been appointed, which will open the season with a smoker in the club's handsomely appointed theater on Saturday evening, May 8. On Sunday, May 16, two score cars will participate in the initial club run, destination to be announced later. Later in the season a one-day open endurance run to one of the North Jersey coast resorts will be put on, and a winter reliability contest is also talked of. It is the intention to have these events for amateurs primarily, for there are more private owners taking advantage of the new club, than of the trade. Improved rules have been outlined, embodying some new features.

ANNUAL ELECTIONS ARE NUMEROUS.

Schenectady, N. Y., April 26.—The following board of governors has been elected by the Schenectady Automobile Club, and they will act as chairmen of the following committees: Membership, George Close; laws and ordinances, W. D. Loucks; exhibits, tours and contests, W. J. Close; good roads, E. F. Peck; grievance, Walter Green; publicity, F. R. Champion; extension, T. H. Soren; signs, E. J. Vrooman.

Middleboro, Mass., April 26.—At the annual meeting of the Middleboro Automobile Club the following officers were elected: President, Levi O. Atwood; secretary-treasurer, Chester E. Weston; directors, L. O. Atwood, C. N. Atwood, C. W. Maxim and A. A. Thomas.

ENLARGED OUTLET FOR FRONTENAC CARS.

NEWBURGH, N. Y., April 26.—Activity is the keynote of the work now being carried on by the automobile department of the Abendroth & Root Manufacturing Company, of this city, the manufacturers of Frontenac touring cars and roadsters. The supposed lateness of the building and selling season has had no appreciable effect here, and it seems that there must be a shortage of high grade cars of from 40 to 45 horsepower which has resulted in a large outlet for the Frontenac. This automobile has an engine of 40-45 horsepower and in all particulars is of standard design and construction. The manufacturers have an established reputation of 40 years' standing as makers of machinery, and have allied this to the production of autos.

J. J. Evans, who was formerly connected with the marketing of the American Mercedes, has just taken charge of the output of the local plant. Agency propositions are at present being considered, and early deliveries assured. In addition to the cars for pleasure purposes, there is also a Frontenac truck which has proven successful, and this will also be made in quantities.

AN ESPECIALLY CONVENIENT AMBULANCE.

INDIANAPOLIS, April 26.—The new ambulance for the Board of Health will be unusually convenient, several points of up-to-date construction having been utilized which have never been found in



Electric Ambulance Just Completed by Waverley Company.

an ambulance before. Chief among these are the electric heater, the convenient arrangement of the electric buttons, special drawers for surgical instruments and the appliances for the control of folding seats and stretchers. Worthy of mention also is the door arrangement. This differs from the ordinary in that two large side doors are used, these being 23 inches wide and opening into an interior open space of 18 inches by 3 feet 10 inches. The open space is located in front of the stretchers, convenient for the surgeon and attendants, while close at hand are the other conveniences.

The dimensions of the body are: Length inside, 8 feet 5 inches; width, 5 feet 10 inches; height, 5 feet 4 inches. The sill is 32-3-4 inches from the ground, and the step is 19 inches up. The wheelbase is 97-1-2 inches, and the tread standard. The chassis is of armored wood, with motor and battery attached to it and thus independent of the body. The motor is large and of exceptional overload capacity. It is operated from a 42-cell, 13-plate battery, constructed for speeds from three to fifteen miles, and an emergency speed of 20 miles per hour. Control is through a four-speed controller.

The interior is handsomely finished in polished hardwoods, with musset leather curtains and upholstery. In this vehicle the builders, the Waverly Company, of Indianapolis, have carefully studied the comfort of the patient as well as the serviceability of the car as a whole. The white color of the exterior gives it a typical ambulance appearance.

LATEST NEWS FROM TIRETOWN.

AKRON, O., April 26.—A combination of interests representing the leading companies in the United States manufacturing tire rims is to be effected in this city shortly, an important step having been taken April 23, when the United Rim Company was incorporated at Columbus with \$10,000 capital stock. The object of the company is not to manufacture rims, but to take further steps toward their standardization.

The incorporators of the company are Edwin C. Shaw, general manager of the B. F. Goodrich Company; P. W. Litchfield, superintendent of the Goodyear Tire & Rubber Company; Arthur H. Marks, vice-president and general manager of the Diamond Rubber Company; H. E. Raymond, sales manager of the Goodrich Company, and Ernest Hopkins, representing the United States Rubber Company, of New York. This company will probably succeed what was formerly known as the "Rim Association," and through the new arrangement one rim will now hold a tire of any size. Companies making rims in the United States are the Diamond Rubber Company (Marsh rims), the Goodrich, Goodyear, the Midgeley Manufacturing Company and the Standard Welding Company, of Cleveland.

The Diamond Rubber Company is following extensive additions to its plant made last year by two large ones planned for this year. The company has begun on a new laboratory that will be 148 feet long by 50 feet wide and three stories high. It is said that it will be the best equipped India rubber laboratory in the United States. Another immense addition will be started soon for factory purposes. It will be 200 feet long, 100 feet wide, and five stories high.

The cross-country auto transit business is becoming a very active industry in this part of the State. This week the Akron Motor Transit Company was incorporated by Akron men with \$10,000 capital stock for the purpose of operating auto cars between this city and the Summit lakes, south of Akron, three to five miles. The service will begin Memorial Day with a specially built 30-passenger, 60-horsepower autobus. The company is to take the place of an interurban car line that was incorporated, but which did not secure sufficient capital to be put in operation. Another auto bus line just starting is operating between two towns west of Akron, and will form the connecting link between two important systems of electric lines, both of which connect with Cleveland and eastern and western points. Still another auto line is to connect a number of county seats adjoining counties where electric lines were first proposed.

SPEEDWELL WILL TRIPLE SIZE OF FACTORY.

DAYTON, O., April 26.—Having increased its capital from \$50,000 to \$250,000, the Speedwell Motor Car Company has announced that it will triple the size of its present factory. Three acres of ground in Edgemont, adjacent to the plant, have been purchased, and on this will be erected a big modern concrete building of up-to-date construction.

Other improvements will follow, and the officials of the company announce that within a year more than 1,200 workmen will be employed. This increase is the result of the growing business in Speedwell automobiles, and additional factory accommodations became necessary. The officers of the Speedwell Company are: President, Pierce D. Schenck; vice-president, M. L. Sternberger; secretary and treasurer, R. A. Herbruck; general manager, J. G. Loomis.

ANOTHER MOTOR BUGGY FROM ILLINOIS.

ROCK ISLAND, ILL., April 26.—Automobiles of the buggy type in four different styles will be built in this city by the Geo. White Buggy Company, and will be marketed under the name of White. The motor will be a two-cylinder air-cooled one, geared with a ratio of 10 to 1, giving a maximum speed of 24 miles per hour. The wheels will be of medium size with large solid rubber tires. No foot pedals will be used in the control.



The Systematic Arrangement of the Pierce-Arrow Factory's Stock Room is a Delight to the Visitor's Eye.

HOW SYSTEM RULES IN ONE FACTORY.

BUFFALO, April 26.—Among the first things considered by the factory manager when a new plant is being constructed is the amount of space to be given to rough and finished stock, and the location of the rooms. Poor stock room facilities and a lack of system in an automobile factory will nullify all plans for economy in plant operation and certainty of output. In the early days of the industry new concerns occupied factory buildings that had been constructed for the manufacture of something entirely different. Makeshifts were necessary in the arrangement of stock rooms, machinery departments, and assembling floor, and parts, in taking their course through the factory, often crossed their own paths as many as a dozen times. Loss of time, the taking up of floor space, loss of parts, and confusion were among the necessary disadvantages of this system.

With the growth of the industry came a new order. When building new factories solely for the manufacture of automobiles, economy in operation was given serious consideration. Manufacturers of not only automobiles, but other articles as well, have no hesitancy in expressing great admiration for the arrangements of floor space, and of manufacturing systems employed at the new plant of the Pierce-Arrow Motor Car Company. The only way in which a part crosses its own path between the time it enters this factory and is placed in position in the cars, is when more than one machine operation is necessary to finish it from the rough stock stage. In this case it is taken to the inspection department after each operation, and when it

has been passed upon there is returned to machinery hall. In their sequence to the assembling floor from the railroad siding where the rough stock is unloaded, the departments are: Receiving room, rough stock department, machinery hall, inspection department, finished stock room, assembling floor. A straight line is scarcely deviated from, from the railroad siding to the assembling floor, the only changes from the direct route being the jogs necessary in going to various machines on the way to the inspectors. The machine shops and inspection rooms are so located that the direction is always a short, straight one, and when necessary to go to upper floors, the parts operated upon in one department pass right along to an elevator. The time saved is extremely valuable, and a large amount of money is thereby saved in production.

The heart of the person who originally planned the phrase, "A place for everything and everything in its place," would rejoice could he make a tour through the rough and finished stock rooms at the Pierce-Arrow plant. There is always a complete list of the stock in hand, and a plan of where every part may be found. In the rough stock department the larger castings, such as flywheels and cylinders, engine bases, and gearcases have their own floor spaces, as do the forgings. Smaller forgings and castings are kept in bins, while the smallest parts are stored in shut steel boxes on shelves. Bars and rods of steel and brass have their own racks, each one labeled, and sheet metal is stacked on the top of the racks. In the finished stock room almost all the parts are kept in steel drawers.



In the Inspection Room Each Workman Has a Desk and Is Seated at the Careful Work of Checking Up Parts Dimensions.

MORE TAXICABS AND STILL MORE.

SPRINGFIELD, MASS., April 26.—A shipment of fourteen taxicabs to the Phillips Automobile Company, of St. Louis, has just been made by the Atlas Motor Car Company, of this city. These newcomers, with the cabs now owned by this company, will make a total of more than twenty Atlas cabs by one company, with more to follow. The two-cycle engine with which they are equipped had much to do with the adoption of this make, as the simplicity, ease of starting and practical indestructibility appeal to the man who pays the bill.

The 1909 cab equipment has the two-cylinder, two-cycle, 20-horsepower engine, equipped with Atwater-Kent ignition system, sight-feed Hancock oiler, gear-driven instead of belt-driven; improved carbureter, with gasoline adjustment on dash; pump circulation, which eliminates all possibility of overheating the engine under the most severe conditions; gear-driven fan, which makes it possible to run engine at highest speed when the car is standing still, without any steaming of the water. A high-grade steel frame is used, the width of which in front is narrowed up three inches to allow maximum cramp of the front wheels and which adds greatly to the appearance. A very superior sliding gear transmission has been developed, which combines all of the good qualities of both the sliding gear and planetary type of transmission.

MAXWELL ENGINE FOR MOTOR BOAT.

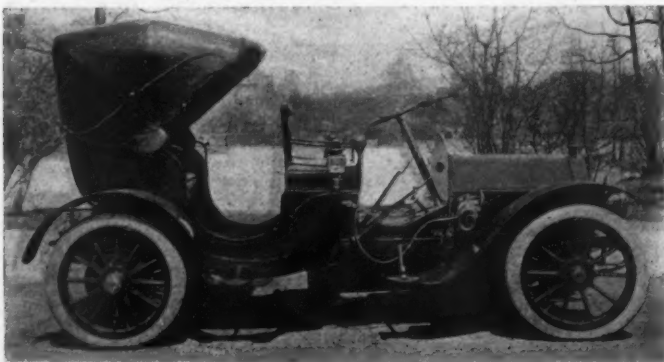
The defeat of the *Dixie II* at the Monaco race meet has stirred up the American motor boat builders, and one of the immediate results is the announcement of a number of new boats. One of the first is to be the *Maxwell-Driscoll*, so named after the engine and the owner. The latter, R. J. Driscoll, of the Tarrytown Yacht Club, is having a boat of the same size as the *Dixie II*, 12 meters, built at the plant of the Hudson River Motor & Boat Works, of Tarrytown.

This will be equipped with a special motor from the works of the Maxwell-Briscoe Company. The number of cylinders to be used is 12, and the power rating is given out as 200. Bore and stroke have not been publicly announced, but the whole construction will be special, to match the especially light hull.

The new boat will be entered in all of the speed boat contests for which it is eligible, including the Fulton celebration and international races.

PALMER-SINGER MODEL FOR SUMMER USE.

The Palmer-Singer victoria is one of the most attractive summer models yet seen in New York. The body follows the conventional lines of horse-drawn carriages, adapted, of course, to its different mounting. It will recommend itself very strongly to people who are just giving up horses for city use. The chassis is of 30 horsepower, insuring considerable touring ability; the double-drop frame allows the body to be hung very low and lends itself to the graceful curves of the design. An extra body of the enclosed type, for winter use, can also be furnished.



Thirty-Horsepower Palmer & Singer Victoria.

WILKINSON ADVOCATES SPHERICAL HEADS.

In a recent discussion of the cooling effect of having the interior of the cylinders of an automobile engine approach as nearly as possible the spherical form, thus exposing a minimum of surface to combustion, John Wilkinson, chief engineer of the H. H. Franklin Mfg. Co., said:

In order to keep the temperature of the cylinder walls of a gasoline automobile engine within working limits the design must be such as to lessen the heat allowed to enter the walls or increase that carried off, or both of these results must be accomplished. Getting less heat into the walls involves one of the fundamental principles of the economy of the gas engine and is best accomplished by reducing the internal surface exposed to combustion to a minimum, which means principally designing the combustion chamber so it will be as nearly spherical as possible.

If the internal surface is less, the less the incoming charge is heated and the less heat is lost to the cylinder walls; therefore the greater the power and efficiency the less heat it is necessary to carry off from the walls to keep them at a working temperature.

This fact does not seem to be well recognized, as we still see engines built with the valve pocket on each side of the cylinder. The internal surface exposed to heat at the time of explosion in a four-inch by four-inch motor, with a semi-spherical cylinder head, is about 38 square inches; in the same motor with a valve pocket on either side of the cylinder it is about 74 square inches, and a good part of this surface has to be left rough. It is evident that the Jacket loss must be much greater in the last instance.

Engines with a hemispherical head show a gain of 25 per cent. in power and efficiency over the type with a valve pocket on each side. This type of cylinder head may also be machined smooth on the inside to reduce its absorbent effect to a minimum.

The concentric valve on the Franklin motor cars was designed to fit in exactly with air-cooling, dome-head, large-intake-valve construction, which would give increased power, increased efficiency and increased cooling ability. This construction also means a shape of cylinder and valves in which expansion from heat is equalized in every direction, preventing heat warping of parts.

FAL-CARS APPEAR ON CHICAGO STREETS.

CHICAGO, April 26.—The newest of Chicago-made automobiles, the FAL-Car, successor to the Reliable Dayton, is now active in the automobile affairs of the city. Demonstrations are being made, and H. R. Averill, the sales manager, reports that 20 cars will be ready for shipment by May 10. They are built in three styles, touring car, toy tonneau, and roadster, all on one type of chassis, with a four-cylinder, 30-horsepower motor, and selling for \$1,650. The firm intends to move from its present quarters at 15 North May street, to a larger plant on the south side of the city, so that the production for this year of 100 cars will be increased to 700 for the 1910 season. The important races and contests will be entered by the FAL-Car, in its classes.

ONE COMMERCIAL VEHICLE DEMONSTRATION.

HARTFORD, CONN., April 26.—An excellent demonstration of commercial car efficiency was afforded by S. A. Miner, who has been utilizing second-hand cars in delivery wagon service. The demonstration was made for the benefit of a large local grocery house. The commercial vehicle was loaded at the same time as were the horse vehicles. Thirty-six boxes of groceries of varying weights were loaded on the Knox car, and, according to the driver of one of the horse teams, it would require 3 to 3½ hours to deliver. The Knox did the trick in 1 hour 5 minutes.

KEYSTONE SIX IS NAME OF NEWCOMER.

NEW CASTLE, PA., April 26.—In the next fortnight the Keystone Six, of 60-horsepower, will be presented by the Munch-Allen Motor Car Company. This newcomer will have a double ignition system, including Bosch magneto, disc clutch, selective transmission, 121-inch wheel base and use 36 by 4-inch tires. The car will sell at \$2,250, completely equipped, and its makers will give a guarantee for one year. The company intends to put out about 250 cars of the 1910 model. It was erroneously printed that the car would be known as the Pennsylvania No. 6.

Told in the Progress of the Industry

Rapid Expansion of Oklahoma Motor Car Company.—An example of the growth of the great Southwest is that of the Oklahoma Motor Car Company, of Oklahoma City. This concern, dealing in automobile supplies for the past two years in Oklahoma, has outgrown its facilities, and has opened a branch, larger than the home office, in Dallas, Tex., from which the Lone Star State will be supplied with accessories. This will be conducted under the name of the Southwestern Automobile Supply Company, at 349-351 Commerce street. A third establishment under the title of the Overland Automobile Sales Company has been opened in Dallas, and it will have the agency for the Overland and KisselKars in Texas and New Mexico. The three concerns are identical in ownership, and President Will T. Brown and General Manager T. B. Funk will have managers in each place.

Waverly Electric in Rural Mail Service.—The use of electric automobiles in city mail delivery service is not uncommon, New York having added three to its equipment recently, but in rural work this type of propulsion has been less frequently used. On route 2, out of Manchester, N. H., Mark T. Hoffman uses a Waverly road wagon of 1905 design. He writes to the Waverly Company: "I am about to put my Waverly electric in commission. This is the fifth summer of five months' use each; but is second season of a new Exide battery which was charged 100 times for the 24-mile trip. The battery did wonderful work, making the trip of 24 miles with hills of 1,000 feet in all, on two volts, or 64 at start and 62 at finish, even on rainy days. This was over the rural U. S. mail route with 50 stops."

Business Men Recognizing the Motor Truck.—The filing of an order for a 5-ton American motor truck by the American Motor Truck Co., of Lockport, N. Y., for the Robert MacKinnon Co., Little Falls, N. Y., one of the largest knitting concerns in that State, tends to show that business men are beginning to understand the difference between the requirements for a commercial car and a pleasure car. This car will replace three heavy trucking teams and wagons, and is built for service alone. It has a four-cylinder 60-horsepower motor, with extra large and long bearings. Its piston area is greater than that of a similar powered pleasure car motor and the revolutions are slower.

New Chicago Home for Premier.—Webb Jay, Chicago agent for the Premier Motor Car Company, has let contracts for the construction of a reinforced concrete building at 2329 Michigan avenue. This will be rushed to completion so that it may be occupied by mid-summer, and will be the western distributing headquarters for the Premier. The first floor will be arranged for the offices, the salesrooms, and garage; the second for making tops; and the third for a stock room and repair shop. A 20-year lease was taken and the structure will be a model of its kind.

Ferry Route Across the Sound.—A short cut for automobilists from points in Westchester County, New York, and in lower Connecticut, to Long Island has been proposed by the Oakland Steamboat Company, Inc. It is planned to run boats at frequent intervals between Rye and Seacliff, and between Stamford and Cold Spring Harbor. Its regular service is between New Rochelle, Rye, Oakland Beach, and Stamford. The ferries across the sound would cut off a great distance now traveled through New York City.

Baker School of Instruction.—The Baker Motor Vehicle Company recently held a school of instruction at its factory in Cleveland, under the direction of its chief electrical engineer, Emil Gruenfeldt, at which representatives of nearly all the Baker agencies throughout the United States were present. Mr. Gruenfeldt gave a series of talks regarding the mechanical construction, equipment, maintenance, care of batteries, etc., and thoroughly demonstrated the new Baker electric models.

M. & W. Tires on Pathfinder.—Tire equipment will play an important part in the Glidden tour this summer, and the Morgan & Wright Company, of Detroit, is pleased by the fact that the E-M-F car which is making the pathfinding trip is equipped with M. & W. tires. These have been standard equipment on E-M-F, and the automobile builders made no change for the hard run on the almost impassable spring roads.

Reo Increases Capital.—The capital stock of the Reo Motor Car Company, at Lansing, Mich., has been increased from \$1,000,000 to \$2,000,000. About \$250,000 will be spent at once in enlarging the capacity of the factory, so that 10,000 machines a year may be built instead of the 7,000 as at present. The plant is now shipping 50 automobiles a day to all parts of the country.



Electric Sightseeing Chairs.

The two-passenger motor-propelled chair, which will be used about Belle Isle, Detroit's chief park attraction, the coming summer. These cars are capable of a speed of eight miles per hour.

Fal Motor Company Plans Southern Assembling Branch.—To insure more rapid delivery of cars in the South, the Fal Motor Company, the recent successor of the Reliable Dayton Motor Company, is planning to have a branch in Memphis, where some of its cars will be assembled. The parts will be shipped from the machine shops in Chicago.

Winton Six Popularity Felt at Factory.—The popularity of Winton Sixes has necessitated a 12-hour day in the machine department and an extension of the assembling department, whereby floor space of about 50 per cent. will be added. Work is going forward and the addition will be ready for use within two weeks.

Vanderbilt Buys Motor Plow.—George W. Vanderbilt is equipping his estate at Biltmore, near Ashville, N. C., with a number of automobiles and other motor-driven vehicles for farm use. He has already installed a motor plow, and a provision wagon.

Weston-Mott Company Enlarges Factory.—The Weston-Mott Company of Flint, Mich., has announced that it will shortly begin the erection of a new factory. The contract has been awarded to the Vinton Construction Co., Detroit.

Dallas, Tex., Dealers Organize.—The Dallas Automobile Dealers' Association has been organized with the following officers: President, M. A. Sacksteder; vice-president, M. B. Burwell; secretary-treasurer, J. B. McGraw.

Covert Motor Car Company in Detroit Field.—The Covert Motor Car Company has begun the manufacture of a medium-priced touring car with a four-cylinder, two-cycle engine.

D.H.K. Company Formed in Detroit.—A new company has been formed called the D.H.K. Motor Car Company, to build light runabouts to sell under \$500.

IN AND ABOUT THE AGENCIES.

Rainier Opens Philadelphia Branch.—The Rainier Motor Company has opened a branch in the Quaker City under the management of J. Knight Neffel. A location at Chestnut and Eighteenth streets, well away from the automobile row, has been secured. Mr. Neffel was formerly sales manager of Smith & Mabley, of New York, and later Paris representative of the same concern.

Firestone, St. Louis.—The two branches of the Firestone Tire & Rubber Company have been consolidated into an enlarged store at 2230 Olive street. The stock of pneumatic tires formerly carried at 3910 Olive street has been moved to the new headquarters, which, until this time, has handled solid tires only. O. O. Petty is the manager of the consolidated branch.

Penn Auto Supply Co., Atlantic City.—The Penn Auto Supply Co., of Philadelphia, as a convenience to its many patrons, has opened an Atlantic City branch at 2006 Pacific avenue, that city. W. C. Price, formerly connected with the Hartford Rubber Co., will manage.



Packard Testers in Role of Good Samaritans.

Detroit is well acquainted with the Packard testing corps under Will Birmingham. It is seldom that one of them is very far away in case of trouble. The other day a horse-drawn wagon, delivering some heavy bars of steel, tipped over turning into the factory yard. Just then Birmingham happened along, and it was the work of but a few minutes to hitch onto the back end of the load and jerk it into place.

Hupmobile, Philadelphia.—To complete its line, now consisting of the National and Rambler cars, Manager Geo. G. Brownlee, of the Tioga Automobile Co., of Philadelphia, has closed a deal for the local agency of the Hupmobile, a Detroit product listed at \$750.

Rapid, Detroit.—The Rapid Motor Car Company, of Pontiac, has opened a garage and salesroom at 467-469 Woodward avenue, under the management of C. S. Bugbee.

TAXICABS AND TRANSIT.

Seattle, Washington.—The Seattle Taxicab Company, which has been operating cars in this city since March 1, now has 10 gasoline machines on the streets, and will continue to increase its service by six cars each week until enough are on hand to supply the demand. The service has proved very popular.

New York City.—A syndicate has made application to the public service commission and the board of estimate for a franchise to establish a bus service on the new Queensboro bridge, pending the installation of trolley service. The bridge is a mile and a quarter long.

PERSONAL TRADE MENTION.

N. H. Van Sicklen, Sr., the founder and former proprietor of *Motor Age*, well and favorably known throughout the Middle West, has announced his newest venture. This is in connection with the Nadall-Van Sicklen Manufacturing Company, of Chicago, of which he is secretary-treasurer. The business has increased to such an extent that new and larger quarters were a necessity. These were secured at 1233 Michigan avenue, where Nadall demountable rims will be handled.

Frank J. Campbell, whose Personal Advertising Service in Detroit was conducted at 242 Griswold street, has moved to more commodious quarters in the Trussed Concrete Building, and has changed the name of his organization to the Campbell Advertising Service. His move has placed him on "advertising square," so-called by the outside fraternity in referring to the neighborhood of the Federal Building.

Horace B. Hills, Jr., has assumed the management of the New York branch of the Royal Tourist Car Company, in its new location on Broadway at Sixty-second street. He will continue his business as agent for the Royal Tourist in Philadelphia. Max Greene, formerly associated with the White, and Chalmers-Detroit cars, will be associated with Mr. Hills in New York.

Fred J. Titus, former well-known champion bicyclist, who has been for the past five years one of the head salesmen for the Harry S. Houpt Co., of New York City, has completed arrangements to establish an agency for the Herreshoff and Houpt cars in New Jersey, at 213 Clinton avenue, Newark.

William E. Botto has accepted the position of general manager of the automobile and garage business conducted by George C. John of New York, in American Mors, Inter-State, and Marmon cars. Mr. Botto recently resigned from his position as sales manager of the Palmer & Singer Mfg. Co.

William W. Fickling, who has been prominently identified with New York second-hand automobile houses, has been engaged to manage the second-hand business of the Automobile Sales Corporation, of Philadelphia.

Robert H. Turner, formerly on the advertising staff of the Philadelphia *Evening Telegraph*, has joined the sales forces of the branch of the Firestone Tire & Rubber Company there.

C. Louis Fitzgerald has been appointed manager of the Newark, N. J., agency for the Packard. Mr. Fitzgerald has been connected with the New York Packard branch.

OBITUARY NOTICES.

Baron Edouard de Turckheim, the head of the de Dietrich firm, with works in Niederbronn, Germany, and Luneville, France, died at the Chateau de Dachstein, Alsacia, recently, aged eighty-one. Two surviving sons, Baron Adrien and Baron Eugene, are at the head of the main works at Luneville.

H. Spencer Lucas, a trustee of the firm of John Lucas & Co., the Philadelphia oil and soap makers, died at his home city on April 16.

PROVIDING, NOT PREVENTING.

In the advertisement of the General Accumulator & Battery Company, Milwaukee, Wis., appearing in the April 22 issue of *THE AUTOMOBILE*, the inadvertent use of the word "preventing" so distorted the meaning that the reading was just the opposite of what was intended. The substitution of "providing" makes it read as it should, viz.: "Current discharged through transformer, making high tension, at the same time providing dual system," etc.

REGARDING ENGINEER LANDAU.

The following communication received from Asher Golden, of Landau & Golden, New York City, is self-explanatory: "We wish to correct a notice in your last issue to the effect that David Landau has been appointed chief engineer of the Palmer & Singer Mfg. Co. We were retained about a year ago by the Palmer & Singer Mfg. Co., as consulting engineers, and have done considerable work for them in this direction. Owing to the recent resignation of Oscar Stegman, the Palmer & Singer Mfg. Co. simply called in Mr. Landau to take complete charge of their engineering department. Mr. Landau is not on the Palmer & Singer pay-roll."

LONG SERVICE OF FACTORY MEN.

Length of service of the men in a big factory plays an important part in the success achieved in raising production to a high standard, and recently an official of the Pierce-Arrow Motor Car Company requested a list of the factory heads and foremen, with the number of years' service of each. In all, the lists made up show that there are 46 men who have charge of the work of production, the highest in rank being the vice-president, whose duties includes the factory management, and from him running down the line to the foremen. The total term of years these men have been with either the Pierce-Arrow Motor Car Company or its predecessors foots up to 442, making the average connection with the company 9.61 years. The man who holds the record for long service is Henry May, vice-president and general manager, who went with the firm in 1873 and has remained with it ever since, a period of 36 years. One foreman has been with the company 28 years and two others for 21 years, while a number have worked continuously for 10 to 17 years.

RECENT INCORPORATIONS.

Mackenzie-Walton Company, Providence, R. I.—To manufacture seamless wire tubing for automobiles and other mechanical purposes. Will erect brick factory at Pawtucket avenue and Geneva street. A. J. Thorley, J. M. Mackenzie and Joseph Walton are members of the firm.

National Lamp and Brass Manufacturing Company, Chicago.—Capital, \$3,500. To manufacture auto lamps and brass goods of all kinds. Incorporators: G. W. Killelea, R. H. Wilson and H. Horner.

John J. Gibson Company, Buffalo.—Capital, \$20,000. To manufacture motors, engines, machines, cars, automobiles and wagons. Incorporators: J. N. Gregory, E. G. Thompson, George Routhead, Jr.

Automobile Owners' Protective Association, Camden, N. J.—Capital, \$100,000. To manufacture automobiles and protect owners. Incorporators: F. J. Curran, J. U. Clarke and T. F. Curley.

Jewel Electric Company, Chicago.—Capital, \$15,000. To manufacture and deal in automobiles, electrical supplies, etc. Incorporators: R. I. Phillips, M. C. St. John and M. C. Diller.

Morgan Avenue Garage, Brooklyn, N. Y.—Capital, \$7,000. To deal in automobiles, operate a garage, etc. Incorporators: J. A. Blanchfield, W. J. Blanchfield, Samuel Newman.

Taxi Motor Cab Company of Boston.—Capital \$375,000. To do a general automobile business. Incorporators: President, E. M. Davenport; treasurer, A. W. Pope.

East Side Auto Company, Attleboro, Mass.—Capital \$20,000. General automobile business. President, C. J. Adams; treasurer, A. N. Cooper; clerk, G. L. Adams.

Knickerbocker Automobile Company, Wilmington, Del.—Capital \$100,000. Incorporators: E. L. Squire, G. W. Dorsey, Jr., Albert Bird.

Miller Brothers, Amesbury, Mass.—Capital \$50,000. To do a general automobile business. President, T. C. Miller; treasurer, S. Anderson.

Brush-Chicago Motor Company, Detroit, Mich.—Capital \$11,000. Incorporators: Frank Briscoe, E. D. Moessner, Paul R. McKenney.

Deluxe Motor Car Company, Detroit, Mich.—Capital \$150,000. Incorporators: M. M. Kaufman, S. R. Kaufman, D. E. Kaufman.

Beljord Garage, New York.—Capital \$18,000. Garage business. Incorporators: D. S. Loeb, Seymour Schampain, A. H. Vitale.

Durham Automobile Company, Durham, N. C.—Capital \$50,000. To manufacture automobiles. Secretary, T. H. Lindsey.

Industrial Automobile Company, Elkhart, Ind.—Capital \$75,000. Incorporators: T. J. Shanahan, W. S. Long, L. D. Hall.

Albert Sterne Motor Company, St. Louis.—Capital, \$15,000. Incorporators: Albert Sterne, Max L. Weiss, Leonard Fassett.

American Reversible Motor Company, Boston.—Capital, \$50,000. President, A. C. Day; treasurer, G. M. Power.

Wakefield Auto Company, Albany, N. Y.—Capital \$5,000. To operate taxicabs and rent autos.

Kalamazoo Carbureter Company, Kalamazoo, Mich.—Capital increased from \$7,500 to \$25,000.

L. B. Repair Company, New York.—Capital, \$10,000. To deal in and repair automobiles.

The Perth Amboy Garage Company, Perth Amboy, N. J.—Capital \$50,000.

NEW AGENCIES ESTABLISHED.

Peerless, Stoddard-Dayton, Birmingham, Ala.—Drennen & Company, Avenue C and Twentieth street. Manager of automobile department, George B. Kelly; manager of mechanical department, A. D. Wood.

Detroit Electric, Boston.—Messrs. Rommelfanger and Binney, 323 Columbus avenue, trading as the Boston Electric Garage.

American Simplex, New York City.—Grant-Isbell Auto Company, 1666 Broadway; Ben W. Rickert, sales manager.

Hupmobile, Baltimore, Md.—Joseph Wellensfeld, in addition to the Oakland.

Lozier, Syracuse, N. Y.—The Amos-Pierce Auto Company, 215 James street.

Haynes, Rockford, Ill.—H. R. Hill, for Winnebago county.

E. M. F., Morristown, N. J.—W. B. Smith

SELECTED AUTO PATENTS.

Issue of April 20, 1909.

918,550. Rubber Vehicle Tire.—Chester O. Henderson, Dayton, O. Filed Sept. 21, 1908.

918,607. Carbureter.—Clarence B. Sturges, Scranton, Pa. Filed April 23, 1907.

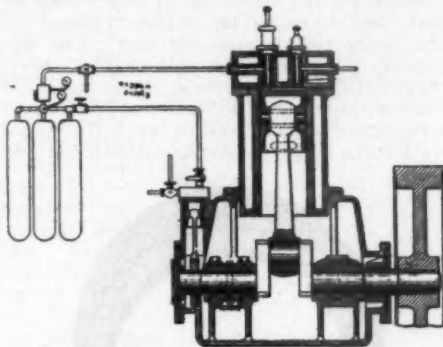
918,621. Change Speed and Reversing Gear.—Luis Wirtz, Bilston, Eng. Filed July 6, 1907.

918,644. Vehicle Wheel.—Lloyd W. Barnhart, Van Wert, O. Filed April 11, 1908.

918,657. Three-Speed Transmission Gearing.—Robert W. Coffee, Richmond, Va., assignor to Lewis M. Kelzer, Baltimore, Md. Filed May 16, 1906.

918,658. Power Transmission Gearing.—Robert W. Coffee, Richmond, Va., assignor to Lewis M. Kelzer, Baltimore, Md. Filed June 25, 1906.

918,679. Internal-Combustion Turbine.—Paul Krause, Babylon, N. Y. Filed Oct. 10, 1907.



Sabathe Improved Cycle Scheme.

918,680. Emergency Stop for Motor Vehicles.—Paul Krause, Babylon, N. Y. Filed Nov. 12, 1907.

918,704. Internal Combustion Engine.—Louis G. Sabathe, Paris. Filed Aug. 30, 1906.

As the cut shows, this inventor is endeavoring to improve upon the process followed out in the ordinary engine. He does this by introducing into the cycle a portion of the compressed burned products, simultaneous with the injection of fuel, and followed by the introduction of a gas capable of supporting combustion. The arrangement is certainly a complicated one.

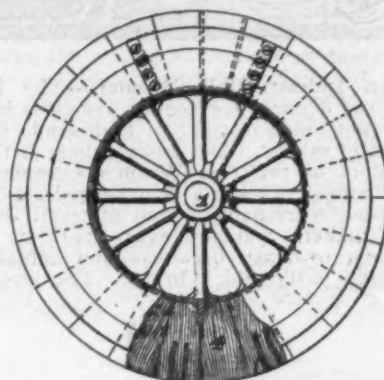
918,726. Spark Plug.—Franz Barthl, Far Rockaway, N. Y. Filed Aug. 12, 1907.

918,820. Tire for Vehicles.—David P. Boyd, Toledo, O. Filed Nov. 23, 1907.

918,846. Tire.—F. J. Gostlin and L. Mueller, Jr., Akron, O. Filed Feb. 5, 1907.

918,936. Transmission Gearing.—Dixon E. Washington, Chicago. Filed March 26, 1908.

918,945. Wooden Rim Wheel.—Herman F. Ball, New York City, assignor to American Locomotive Company. Filed Aug. 27, 1908.



Ball's New Truck Wheel.

This wheel is more suitable for truck use than pleasure cars, and is doubtless intended to be tried upon the trucks now being brought out by this company. This is a subject that has been tackled before and without success, so it is to be hoped that the present trial will not meet with the same fate as its predecessors. For heavy truck tires, the solid rubber tire represents too high a depreciation figure, hence the various attempts to replace it with something less expensive, of which this is one.

918,987. Shock-Absorbing Device for Vehicles.—Claud H. Foster, Cleveland, O. Filed Jan. 21, 1907.



Foster Shock Absorber.

Foster's various inventions are all good, and the appearance of the latest seems to imply that it is good, too. It has been on the market for some time, so will not be described in detail. A pair of tapering side plates carry between them a sliding member which is attached to the car. The rise and fall of the sliders is resisted by the taper sides of the fixed member.

918,996. Cage for Ball Bearings.—Ernest Geshke, Charlottenburg, Berlin, Germany. Filed Nov. 20, 1907.

919,101. Clutch Mechanism.—C. L. Whaley, Augusta, Ga. Filed Dec. 14, 1907.

919,104. Valve Actuating Mechanism for Explosive Engines.—Alex. Winton and Harold B. Anderson, Cleveland, assignors to Winton Motor Carriage Company, Cleveland. Filed Sept. 8, 1908.

919,123. Spark Plug.—J. W. Brown, Jr., Camden, Ark. Filed Sept. 23, 1908.

919,174. Combined Turbine and Internal Combustion Engine.—John Hutchins, Moorfields, London, Eng. Filed Jan. 22, 1907.

919,276. Spark Plug.—Theodor Winestock, Stuttgart, Germany, assignor to Otto Charles Winestock, Perkinsville, Vt. Filed April 30, 1908.



Assembling Department of the E-M-F Factory Showing Completed Cars.

Information for Auto Users

An Indestructible Wrench.—The increased demand for socket wrenches has brought out a number of high-grade devices of merit. Chief among these is the product of the Rex Wrench Company, of Boston. This is a drop-forged article of such workmanship and material that the makers warrant every part of it against ordinary breakage and actually replace parts which break. The work-



REX WRENCH HANDLE.

ing parts of the handle and the fork heads are drop-forged from a high carbon steel, and are case hardened. The sockets are steel castings by a new process that renders them very tough, so much so as to be unbreakable. In addition, a patented, telescopic, reversible handle may be had if desired.

As put on the market, the wrenches are in sets, varying from eight socket heads upward as high as one wishes to



A SET OF REX WRENCHES.

go. For instance, a set for all purposes, and especially adapted for motor boats, motors, and complicated machinery, is put out in a handsome oak box, at \$12. This set consists of the patent handle, screw driver, eleven fork heads, and eight hex socket heads. This will take all nuts, bolts, and cap screws, whether square or hexagon, from 1/4 inch up to 7/8 inch. These are furnished with a blue mottle finish, but if nickel is desired, it may be had at a slight additional cost. The handle is worthy of special mention, being complete in itself, extended or closed by the pressure of the hand. The sockets may be adjusted to any position instantly, and may be taken apart with ease and speed. When so taken down, the length is reduced from 14 to 8 inches.

Stein Automobile Tires.—Several features are embodied in the clincher tires made by the Stein Double Cushion Tire Company, of Akron, Ohio. Among these are the absence of lugs, the quality of not creeping, and the formation of the clinch. The beads, instead of ending, as is general practice, with a space between them on the interior when in place upon a rim, in the Stein tire overlap, thus forming a double cushion for the tube, preventing the entrance of any water or dirt, and keeping the entire volume of the inner tube above the rim. The design is patented. The shoes have been thoroughly tested during three years of road work, and with their wrapped-tread construction have shown that the quality is of a high standard, nothing but the



STEIN DOUBLE CUSHION TIRE.

best of materials—old, fine, Para rubber and Sea Island cotton—being used. With the bead or clincher overlapping, the tube does not come into contact with the rim and, it is claimed, will not pinch or chafe, remaining naturally round. The strain is equally divided upon the walls. The valve stem holds the entire shoe in place, there being no lugs, but the system prevents the tire from creeping. Stein tires are made in all popular sizes, and will fit any clincher, detachable or universal rim.

Banker Wind Shield.—Spring, the windy season, is the time for wind shields, and motorists, now getting out their cars, will do well to consider this useful accessory. The Banker Wind Shield Co., Pittsburg, Pa., are out with an extra fine product in this line, consisting of the No. 1 shield, which is not divided, and No. 2, which is double folding. The latter is parted in the center, below the line of vision. There are no strips of metal across the center of the

shield. In their place the plate-glass is supported on shelves extending from the frame. The upper glass folds on strong, extra heavy, piano-type hinge, and is held in place by a special clamp, which, with the rubber buffers, prevents rattling. The glass is 1-4 inch thick and of French plate. The frame is made of a single piece of 7-8-inch stock, with a 3-8-inch groove. The glass sets in this on a channel-shaped rubber, without bolts or screws to fasten it. The rubber



BANKER NO. 2 WIND SHIELD.

and the absence of metal fastenings insures the total elimination of noise, heretofore a big objection in wind shields. All clamps, bolts, hinges and other metal parts are of brass, highly polished, in this way securing the distinctive appearance which discerning motorists seek after so eagerly. The telescoping tubes are of 3-4 and 5-8 inch tubing, which insures lightness and rigidity. They are fastened securely to the shield by a special clamp, so as to be held in a vertical or horizontal position as desired. Each end of the tubes is provided with a ball and socket joints with more rubber buffers to prevent rattling. All wood used in the construction is of selected stock, either of mahogany or walnut, as desired. This is given an extra fine piano finish. It can be fitted to any car. Being very simple, this is the work of but a minute.

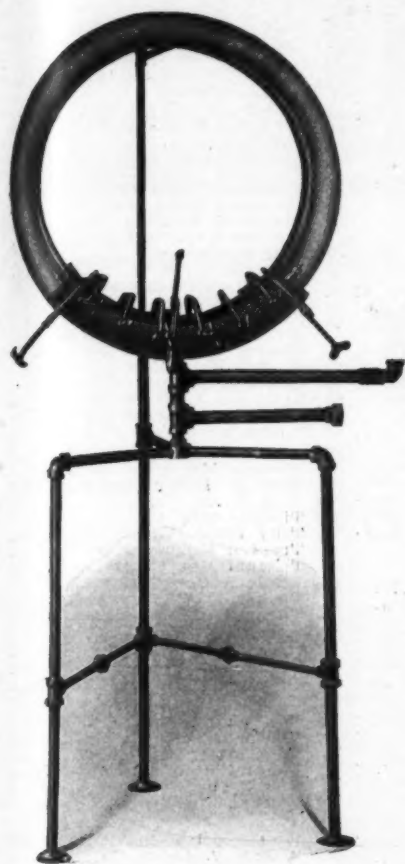
Yemco Quick-Adjustable Wrench.—Wrenches that can be operated by automobilists when in inaccessible places about a car are exceedingly handy. The York Electric & Machine Company, of York, Pa., has been marketing successfully in recent years the Yemco wrench, which can be used with one hand simply



YEMCO WRENCH LOOKS LIKE ANY OTHER.

by pushing a little pin in the sliding jaw. Its appearance is similar to that of any other wrench, 8 inches long, made of dropped-forged, case-hardened steel, and it can be moved to any hundredth of an inch and will hold at that point without further manipulation. In using it, the jaw is pushed up with the thumb, first slipping the jaws open, hooking one over the nut, push up the other one and releasing the pin.

Marble System of Vulcanizers.—A method of repairing automobile and other pneumatic tires that is entirely different from any other now in vogue is that of the Marble system, manufactured by the M. E. Haywood Manufacturing



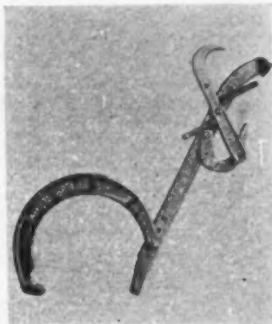
MARBLE VULCANIZER READY FOR USE.

Company, of Indianapolis. The principle is that of local application, heating only the part of the tire that needs curing, so that the remainder is not liable to deteriorate. If a tread is to be put on, only the raw material going into it is heated, and the bead and side walls are scarcely warmed. The plant is composed of the following parts: three inside patch vulcanizers, by which a broken shoe is repaired from the inner side and becomes stronger; three retreading vulcanizers, suited for tires ranging in size from 28 by 2½ inches to 36 by 5, taking up one-third of the circumference of the tread; one side wall and rim cut vulcanizer, which applies the heat and pressure directly to the parts to be cured, such as torn beads and sides; one tube arm, which will accommodate at least twelve tubes at once, clamped under pressure; one motorcycle vulcanizer for motorcycle tires; two patching vulcanizers for all size tires and taking up to 20 inches in length; one tread roller, to roll stock under greater pressure than by hand; complete frame of piping with globe valves and steam gauge, serving also as a steam line; and pads, clamps and complete sets of tools. This outfit enables a small dealer to have a complete tire repairing plant in a unit.

Permanit for Healing Punctures.—A preparation which may be placed in tires to heal punctures and prevent porosity is being imported by the Adolf Karl

Company, Inc., of Newark, N. J., and is sold under the name of Permanit. According to the officials of the firm, this material is a powder, there being no liquid form to fill the valve, and when a nail or something else sharp forces through the casing and tube, the powder acts to fill the space and prevent deflation. It can be used in any size tire, from that of a bicycle to the largest ones for automobiles, and numerous letters of commendation of it are received.

Universal Auto-Tire Remover.—This is more of a time saver than anything else. It does away with the use of a hammer in removing tires, thereby protecting and keeping in good condition rims, tubes, casings, fingers, and tempers. Being very simple, any one may use it. The natural strength of the tool makes it impossible to break it. Being easily adjusted, it can be made to fit any size tire or rim. The principle upon which it works is that of the compound lever. It is made in San Francisco.



AUTO-TIRE REMOVER.

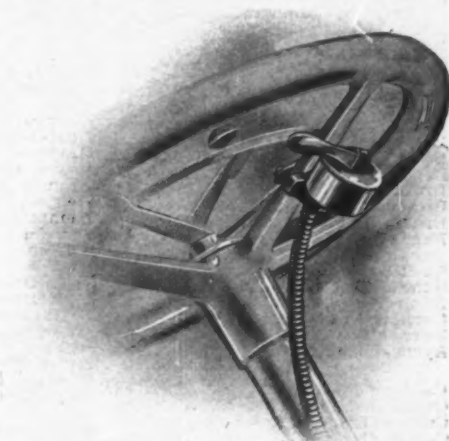
Borbein's New Roadsters.—A new model of roadsters, ready for the power plant, is being built by the Borbein Auto Company, of St. Louis. The running gear and body are sold complete, the purchasers having only to install the motor and transmission and supply tires. The latest type is made with seats for four, all set low to increase ease of riding, with high cushions and upholstered with dark-green leather. The front seat is divided and has a metal shield from the rear of the dash to the front of the rear seat. The rear seat, wide enough for two passengers, is not divided, making the complete body a surrey in style.

The front axle is of the I-beam type, 2¾ inches high, with annular ball-bearing spindles; the rear axle is of the floating type for shaft drive, with its gears in the ratio of 2½ to 1. Both internal and external brakes are furnished; the wheel base is 120 inches, and the tread standard 56. The artillery wheels are fitted with quick detachable rims for 34 by 4-inch tires. Reinforced metal fenders and running board are all fastened in place. The car is designed to take a

four-cylinder engine of medium size and any type of transmission; sold with one coat of lead paint, and including radiator, hood and steering gear. The Borbein Company builds all styles of running gears, bodies, axles and wheels.

Steering-Wheel Switch.—The awkward reaching for the switch on the dash or under the seat will soon be a thing of the past, if autoists appreciate the device just brought out to dispense with that. It is no more nor less than a properly designed switch, intended to go on the steering wheel and be operated in that position by the driver, without other movement than that of the fingers. It is intended to go on the right hand, underside of the wheel.

Four positions are provided as follows: Off, battery, magneto, magneto and battery together. The latter allows



CONNECTICUT STEERING WHEEL SWITCH.

of its use on cars with two separate ignition systems, and is no hindrance on cars with a single system. The size is small, being but one and a half inches in diameter. It is entirely waterproof, and dustproof as well. The construction is of a high class, being entirely of brass. The method of fastening is by means of a bracket under one of the arms. The controlling lever may be removed at will, making the car safe from interference during the driver's absence. There are but two wires used and these are encased in a flexible brass tubing, through which they pass to the magneto and battery.

It is manufactured by the Conn. Telephone & Electric Co., Meriden, Conn.



THE BORBEIN AUTO COMPANY'S NEW MODEL ROADSTER.

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QUALITY
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STEEL HANDLE MODEL
WRENCH

Co'es New Auto Wrench

Sizes:
8-in. and 12-in.

Special Features:

Narrow Jaws Es-
pecially Made for
Automobile Work,
Without Sacrificing Strength.

COES WRENCH COMPANY, Worcester, Mass.

6"-size jaw opens 1 1/4".
Takes any spark plug.
12" jaw opens 2 1/4".

